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THE
BRASILIAN NAVIGATOR;
OR
SAILING DIRECTORY
FOR ALL THE
# COASTS OF BRASIL, &c.
FROM
THE RIVER PARA TO THE RIO DE LA PLATA;
INCLUDING
GENERAL INSTRUCTIONS FOR THE ROUTES,
BOTH FROM
ENGLAND AND FROM NORTH AMERICA,
WITH DESCRIPTIONS OF, AND DIRECTIONS FOR, THE
MADEIRA, CANARY, AND CAPE VERDE, ISLANDS,
FERNANDO NORONHA, &c.

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SELECTED, CHIEFLY, FROM THE MEMOIR ON, AND INSTRUCTIONS FOR,
THE 'ATLANTIC OCEAN,' AND THE NEW SAILING DIRECTORY
FOR THE 'ETHIOPIC OR SOUTHERN ATLANTIC OCEAN,'

BY JOHN PURDY;

TO ACCOMPANY LAURIE'S NEW GENERAL CHART OF THE COASTS WITH
PARTICULAR PLANS OF THE HARBOURS.

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THE CHART which this book is principally intended to illustrate is entitled "GENERAL CHART of the COASTS of BRASIL, &c., from the RIVER PARA to BUENOS-AYRES; with PARTICULAR PLANS of the HARBOURS. Constructed, chiefly, from the Surveys of the BARON ROUSSIN and CAPTAIN WM. HEWETT, adjusted by the later observations of Captain PHILLIP PARKER KING, Captain ROBERT FITZROY, and other distinguished officers of the British Royal Navy." Three large sheets, with Views, &c. Price, with the Book, 12*s.*

The AUTHORITIES on which the Chart has been constructed are fully described in "*The new Sailing Directory for the Ethiopic or Southern Atlantic Ocean,*" mentioned in the title page.

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BRASILIAN DIRECTORY.

*** THROUGHOUT this Work the given LONGITUDE is the LONGITUDE from GREENWICH. In the Sailing Directions the BEARINGS and COURSES are those by COMPASS, unless where otherwise expressed; but those given thus—[*W.S.W.*]—signify the TRUE; and the given direction of Wind, Tide, and Current, is always to be considered as the true. The DEPTHS are those at low water, spring-tides, and the MILES Geographic, of 60 to a degree.

SECTION I.

GENERAL OBSERVATIONS *on the* WINDS, SEASONS, TIDES *and* CURRENTS.

I.—OF THE WINDS AND SEASONS.

THE nature of the perennial, periodical, and variable, winds, which prevail to the northward of the Equator, and which include the Harmattan, on the African coast, with the south-easterly trade-wind of the Ethiopic Ocean, has been described in our former Book for the Atlantic Ocean. But on the latter (the S.E. Trade) some further explanation may be given, and prove useful.

The S.E. trade-wind has been described as more regular than the N.E., and much more serene. Its northern limit, as shown on the charts, and in the volume above mentioned, comes up, in the summer season of the northern hemisphere, very far to the northward of the Equator; so that its mean annual limit is in about 2½° N.; which is probably occasioned by the excessive heating of the land of Africa, near the Equator. The N.E. trade seldom proceeds so far South as to reach the Equator.

It has been remarked that both trade-winds, in the *Eastern* regions, blow more directly, that is, more northerly or southerly, toward the Equator than in the ocean at large. The S.E. trade, in particular, continues very far southerly; so that, within a line drawn from 2° N. longitude 15° W. toward Sierra Leon, the wind is seldom to the eastward of S.E.; but becomes more and more eastwardly as it proceeds westward.*

ON THE EASTERN COAST OF BRASIL, between the months of September and March, the winds generally prevail from N. by E. to N.E. by E.: between March and September, the prevailing winds are from E. by N. to E.S.E.

The former of these is generally termed the NORTHERLY MONSOON, and the latter, the

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* In March, 1823, H. M. S. *Tartar* crossed the Equator, after a favorable passage from Tenerife, in longitude 22° 13′ 20″ W. with a strong breeze from the S.S.E. This was the first of the S.E. Trade, which was thence found to the latitude of 17° S. and longitude 35°.

An intelligent commander in the East-India service reported, some years ago, that he had once found the N.E. Trade wind reduced in breadth to nine degrees only, and that it then extended to several degrees across the Equator. The month is not given; it was probably March.—*(Major Rennell.)*

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southerly one; although there appears, in fact, to be no direct and opposite change in them on or about the equinoxes, as is generally the case with the winds so called. These winds are simply a continuation of the S.E. trade, *which changes its direction* as above described, and as influenced by the land on its approach thereto.

The influence of the land, or rather of its *temperature*, is more or less, according to the action of the sun at the particular seasons of the year. When the sun is to the northward, no particular difference is observed in the S.E. trade, but it may be carried within sight of the coast, with scarcely any deviation; nevertheless, about both equinoxes, but more especially when the sun is advancing to the northward, calms and very light winds, with apparently no settled quarter, will prevail near the coast; and this may be said to be more particularly the case on that part of it between the Abrolhos and Cape Frio. As the sun advances to the southward, the trade-wind will gradually come round to the north-eastward, and will have its retrograde movement with the return of the sun to the equinox. At this latter season, ships, on approaching the coast, will begin to discover this northerly inclination of the S.E. trade, when within four or five degrees of it, and which they will find gradually to increase as they incline to the westward.

Within a few miles of the coast, and in the different roadsteads and harbours, the wind generally blows directly upon it; and, in the deep harbours, and upon the shore, this is, generally, superseded by a land-breeze, which sometimes lasts the greater part of the night. About Rio Janeiro, this land-breeze sometimes extends as far to seaward as Round Island, while at Pernambuco it rarely reaches the roadstead.

The preceding remarks are those of Captain Hewett. Pimentel, and, after him, M. D'Après, has said that the winds of the northerly monsoon, between September and March, are from N.E. and E.N.E., or less northerly than as above; and that those of the southerly monsoon are from E.S.E. to S.S.E., or more southerly. It may, therefore, be admitted that they do sometimes prevail more from the south, and that those near the north but seldom occur.

Mr. Lindley, in his Narrative of a Voyage to Brasil, having resided a considerable time on shore, at Bahia, &c., has described the in-shore wind as follows:—"From Cape St. Augustin, (southward) the wind blows, nine months in the year, chiefly north-easterly in the morning, and north-westerly during the evening and night; this continues gradually changing along the coast, till, at Rio Janeiro and the Rio Plata, it becomes a regular land-breeze from evening till morning, and throughout the day the reverse. During the three stormy months, that is, from the latter end of February to that of May, the wind is, generally, southerly, blowing very fresh and squally, at times, from the south-west."

Captain Hewett has observed that, the winds off Cape Frio are seldom found to the southward of East; and, in the northern monsoon, they are generally to the northward of N.E. Heavy and violent squalls are occasionally met with in rounding the cape, to obviate the effects of which every precaution is required.

The same officer adds that, at Rio Janeiro, the sea-breeze varies in its commencement from ten to one o'clock in the forenoon, and ceases in the evening between the hours of seven and eleven. At the full and change of the moon, violent squalls from the N.W., named by the Portuguese "TERRE ALTOS," immediately supersede the sea-breeze, lasting from four to six hours.

The late *Captain Peter Heywood*, in the British frigate *Nereus*, was for three years on the Brasil station, and the greater part of that time in or near the River Plata; this gentleman describes the winds hereabout as follow:—

"At the ENTRANCE of the RIVER PLATA, the prevailing winds, during the summer months, from September to March, are north-easterly, with tolerably clear weather over head, but a dense atmosphere near the horizon. These winds haul gradually to the eastward as you advance up the river; and, about the full and change of the moon, strong breezes from the south-eastward are common at this season, accompanied with rain and foul weather. At Buenos-Ayres, during the summer months, the S.E. winds are generally fresh in the day-time, hauling round to the northward during the night.

"During the winter months, from March to September, the prevailing winds, at the entrance of the Plata, are S.W., or more westerly; but, up the river, more generally from the northward, than from the southward, of west.

"The winter season is the best, in point of weather, at Buenos-Ayres; for, the winds being chiefly from N.W. to S.W., the water is smooth, and the communication can be kept up between the shore and the shipping with more facility. The weather is sometimes, but not frequently, foggy. Fogs are most common in the months of July, August, and September, and prevail more at the entrance of the river, as far up as the S.E. tail of the Ortiz, than above the banks."

The Variable Winds, in the southern regions, being generally similar to those of the northern hemisphere, require no description.

Having given above a general description of the Winds on and near the Brasilian coast, we now add some additions to the same from the "*Pilote du Brésil*" of the Baron Roussin, 1827.

This gentleman has observed that the general classification of the winds into two monsoons, according to Pimentel, &c., requires considerable modification: for, in his experience on the different parts of the coast, he found the winds very variable in the two seasons: for example, in five months of a southern monsoon they had not forty days with the wind E.S.E. or S.S.E., though, on another coast, easterly winds may more certainly be expected. The navigators of these coasts reckon much more on easterly winds than any others in the months of October, November, and December, which may be considered as intervening months between the monsoons. The summary given in the Tables of Winds, &c., show, from nearly one year's navigation on the coast of Brasil, their ordinary mutability. The first Table shows the observations made on 130 days of the southern monsoon, commencing on the 20th of May, 1819; and it may be noticed that there were only thirty-five days of wind from the S.E. quarter, such as might be expected according to the general classification. During thirty-eight days the winds were from the N.E. quarter, such as might be expected in the northern monsoon, and afterward there were six days with the wind between North and West, and twenty-three days between West and South.

By the Second Table, which includes the observations of 153 days of the northern monsoon, commencing 1st September, we find seventy-five days of south-easterly winds, seven days with the wind between North and West; six days with the wind between South and West, and only sixty-two days with the wind between North and East.*

In the midst of these varieties we find again certain particular winds; the one accidental, the others periodical, and which seem to be of a local and limited nature. Of this class are the S.W. squalls, which come on during the rainy season, at the times of new and full moon: the Brasilians call them *Rebojos*, and they prevail for three or four days; moderate when accompanied by rain, but with greater strength when the sky is unsettled.

The other accidental winds are of the nature of squalls, and are found principally in the environs of the Abrolhos: hence they are called *Abrolhos squalls.* They are most frequent in the months of May, June, July, and August, when the season is very wet, and the general wind from E.S.E. They proceed, it is said, from small white and round clouds, and with a force that is irresistible.

The LAND BREEZES, on the coast of Brasil, are nearly regular, and are felt all night during the greatest part of the year. They are found on all points of the coast between Maranham, in the north, and St. Catherine's, in the south, but vary in force and regularity according to the season and place. On approaching the Equator, the more discernible they become. At *Rio Janeiro* they occur daily, and seldom rise before nine o'clock in the evening, and do not finish till the morning of the following day. Such, too, is the case at *Espirito-Santo, Porto Seguro, Bahia, Pernambuco,* and other places similarly situated.

During the northern monsoon the land-breezes are more regular than in the southern monsoon; they are also stronger, because then the volume of wind comes more direct, and beating constantly against the coast, the re-action causes a freshness in the weather on shore, which produces a more regular and stronger effect.

In the southern monsoon the winds are more variable to the South and S.W.; the land breezes are mixed up with them, and are not to be distinguished.

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* The Tables here referred to are given in the '*New Sailing Directory* for the Ethiopic or Southern Atlantic Ocean,' pages 58—60.

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The sea-breeze is mostly stronger and broader than the land-breeze. This is the effect of vapour raised from the earth, and accumulated in great quantity during the day; condensed afterward by the coolness of the night, it falls and causes the air to expand with greater force.

Vessels cannot always be certain of finding the land-breezes at a certain time in making for the ports of Brasil. But, in general, on advancing southward, following the coast, the winds in the rainy season will be found between South and West, and between the *Alagoa das Patos* and *Cape Frio* it sometimes blows violently from between S.E. and S.W. and from the N.W.; at times, there are hurricanes, similar to the *Pamperos* of the Rio Plata, which are dreadful. Of these, the prognostics are the same as of a European gale. If the sun sets environed with thick clouds, if the land appears very distinct, and seems to rise up, approaching the observer, you may expect the winds to blow from South to S.W. till it brightens up. Fortunately these gales do not long continue; when furious, they rarely last more than 24 or 30 hours, and their strength and duration diminishes on approaching the Equator. When the S. E. or S.W. winds of the southern monsoon are moderate, they come strong from the eastward during the day, and approach the west during the night.

So soon as the wind approaches the East the weather always clears up; to the contrary when it turns toward the West, and the mist comes on more and more thick. The winds are stated to come from the eastward in all the tropical seas; this is their natural course; the interruptions or changes which occur, in advancing to the land, are nothing but the crisis when passing from one to another. At 7 or 8 leagues from the coast the general motions of the monsoons will be found.

Again, from a communication of *Lieut. John Evans, (a)* R.N., on a passage toward Cape Horn, we have the following remarks, dated 30th May, 1824. Wind steady at N.N.E.—"It appears to me, from all that I have heard and read on the subject, to be rather an extraordinary circumstance, our carrying the wind from N.N.E. in the manner we have done, and are still doing, at this time of the year, in the parallels we are passing. After crossing the equator we had the S.E. trade inclining more toward the East than could have been expected, with the sun having northern declination increasing; seldom blowing from the southward of S.E., and generally steady at E.S.E. until the 26th instant, when, in lat. 20° 2′ S., and long. 38° 11′ W., being about two degrees from the Brasilian coast, the wind hauled round to the northward and eastward, and since the 27th we have experienced it steady at N.N.E., generally falling lighter and lighter toward the evening, and freshening up again at night.

While sailing along the Brasilian coast, I was not so much surprised at the northerly inclination of the wind; although, I believe that, during the months of the S.E. monsoon on this coast instances have been very rare (I have never heard of one, although I have been several years upon the station,) of a ship sailing along the land, as we did, with the wind sometimes due North, and never to the eastward of N.N.E.; but now, that we have, since taking a departure from Cape Frio, increased our distance so much from the coast, our position being opposite to the deep bight that falls in westward, to the southward of Rio Janeiro, it certainly does appear to me a strange circumstance that the wind should still continue steady at this point, being entirely at variance with all the authorities I have consulted with respect to the prevailing winds in this hemisphere at this season; neither agreeing with the southerly monsoon of the coast of Brasil, nor the S.E. trade in the open ocean.

This northerly wind continued from 20° 2′ S. and 38° W. to 30° S. and 46° W. veering then to the N.W., round to the southward, and taking the sweep of the compass round again to the northward."

The SEASONS of BRASIL may be considered as two only; the *Dry* and the *Rainy*. On all the *Eastern* Coast the dry season commences near the end of September, and continues until February, and during the five months of its continuance, thunder-storms frequently occur, but it seldom rains.

The rest of the year includes the rainy season; though the rains are not so constant as fully to justify the name. On the *Eastern* coast, the only months which may be thus considered are May, June, July, August, and sometimes a part of September. On the *North* coast the periods vary; for the heavy rains there commonly begin in December; although, as on the eastern coast, they include May, June, July, and August.

The CLIMATE of PARA.—Situate immediately beneath the Equator, the climate of Para is hot and sultry; the thermometer averaging throughout the day from 84° to 89° in the shade; and at night occasionally falling as low as 75°, with very heavy and copious dews, especially upon the river, wetting the boats as if a shower of rain had occurred. The river water is warm, generally 84°; as the air cools in the evening, it chills the surface of the water; and, in doing so, it emits steam or aqueous vapour into the cool atmosphere. Thus the fog, or mist, arises from the warm water of the river, and is not a deposit of dew from the atmosphere upon a surface cooled by radiation. Precisely similar to what occurs in the colder regions of the north, when water is rapidly losing its temperature, previous to freezing, it smokes with steam, and emits a vast volume of vapour, not a drop being deposited on the land: and it is to this that we must refer the mists and fogs, rising from the warm valleys, often before sun-set, and not ascribe them to the deposit of dew from the atmosphere.

There is no difference of temperature throughout the year; the mean is 84°. As already shown, there are two seasons, the wet and dry. The wet or rainy season commencing in the latter end of December and continuing until July, raining more or less, every day, for many hours, without intermission. The air is sultry and oppressive, with light variable winds, the most aweful thunder and lightning, violent squalls of wind occasionally from different points of the compass, and tremendous heavy rain. Ships are often detained several months; not being able to take in their cargo.

It generally begins to rain about eleven o'clock in the forenoon, and continues until 9 or 10 at night. The early part of the morning from midnight is mostly fine. The thunder-storms take place, most frequently, in the afternoon, about two or three o'clock. The same circumstance occurs at Rio Janeiro. The period of the hour of the storms is not confined to this place, but occurs at many others. The country is flooded in many parts during the rainy season.

The dry season at Para is from July to December. During this period rain is a frequent occurrence, and thunder-storms likewise in the afternoon. This is the *windy season*, it blowing fresh from the N.E. during the day, with a light breeze only in the evening. Lightning is frequent in the horizon every night.

Although from the appearances of the banks of the Rio Para, its muddy beaches and masses of filth, it might be supposed to be the 'centre of yellow fever,' yet those who sleep on the river are generally healthy, and enjoy a fortunate exemption. Intermittent fevers or agues, however, attack new comers, and higher up the river they are more common. Those employed in the gathering of sarsaparilla are very frequently attacked with fever, and many natives die of it. Dysentery, tetanus, &c. are common. The small pox, in 1825, is said to have destroyed 5000 people, and to have proved the most destructive scourge they ever experienced. Hydrophobia is almost unknown.*

CLIMATE AT MARANHAM.—The wet season commences at Maranham in the latter end of December, or the early part of January, and continues until June or July; during the whole of these months an immense quantity of rain falls, the most aweful thunder-storms occur, in which lightning is remarkably vivid; the weather is oppressively hot, and the wind light and variable, veering all round the compass in the course of twenty-four hours. The dry season continues from July to December, in which period there is, generally, a fine fresh breeze from the N.E. or E.N.E. The nights are attended with lightning, but no thunder; and a few showers of rain sometimes occur.

The climate of Maranham is naturally hot, and, as at Para, there is little variation of temperature throughout the year, the average being 82°. The general range of the thermometer is from 76° at night to 86° in the day-time, even in the most shady situations. The barometer ranges from 29.92 to 30.1, the average being 30 inches, and the horary oscillation about the tenth part of an inch; it falls from 9 *a.m.* to 3 *p.m.*, and does not appear to be affected by the fall of rain.

The climate here is generally regarded as healthy; the most sickly time being during the transition from the wet to the dry season, or about July. The wet season is not considered unhealthy.

In the province of Seara or Ciara, to the east of Maranham, the droughts are occasionally severe. A few years ago some thousands of persons perished from the want of water. Many fled to Rio Janeiro and to Maranham, and the crops were nearly all destroyed.*

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* Mr. Webster's Narrative of the Voyage of the Chanticleer, Appendix, p. 339—342.

The CLIMATE of FERNANDO NORONHA, though abounding in vegetation and moisture, is very healthy. The dry season commences in July, and continues throughout August, September, October, November, and December. The wet season is from January to June, inclusive. In the first three months of the rainy season thunder and lightning are common; and heavy surfs prevail, especially about Rat Island, at the same period when similar surfs prevail at Ascension and St. Helena, as shown hereafter, with the wind light and variable from the N.W. In the dry season there is, at times, a very scanty supply of water here, but, in the wet season, a little deluge.†

RIVER PLATA.—The climate of Monte-Video is temperate, but fluctuating and tempestuous. It is much healthier than that of Buenos-Ayres, and totally free from those marsh fevers which are common at the latter place, in consequence of its situation up the river. In winter, slight frosts are sometimes observed, but no snow has been known to fall at Monte-Video. The mean temperature of the winter is about 55°; that of the river-water at the same time being the same. The weather, during spring, is very variable and liable to storms. In the summer and autumn it is sultry and oppressive, especially during the long calms which take place; but in the middle of the day there is generally an agreeable breeze from the S.E. Northerly winds are accompanied by rain, and a S.E. wind is frequently so: but the wind from the S.W. is most free from it. Violent gales are common at all seasons of the year, attended frequently with thunder-storms; but these are most severe during summer and autumn. Sometimes the thunder-storms are accompanied by hail-stones of a considerable size, which not only break windows, but kill poultry; they often terminate in a *pampero*, the well-known hurricane of the country. It is said that, in a pampero, sand and small gravel have been blown on board the ships in the roads, a distance of seven or eight miles from shore.

Mr. Webster has described the indications of a pampero, from his own observations, as follows:—The weather is sultry during a few days, with a light breeze from the East or N.E. ending in a calm. A cool light wind then sets in from the South or S.E., but confined entirely to the lower strata of the atmosphere, while the clouds above are moving in the opposite direction from N.W. to S.E. The northern horizon, as night advances, becomes dark with heavy lowering clouds, accompanied with lightning from East or N.E. The southern wind now ceases, and is followed by variable winds from the northward. Heavy clouds are thus brought over; and lightning, accompanied by thunder, follows in a most terrific manner. The wind veers gradually to the westward in violent gusts, the lightning becomes more vivid, and the thunder more aweful; a gale of wind follows from the S.W. more violent, but of short duration, and fine weather ensues.

These pamperos are very destructive to shipping, and frequently occasion wrecks and the loss of boats. The lightning is beautifully coloured, presenting the hues of orange, violet, and pink. Mr. Webster adds, "I have also witnessed at Monte-Video very remarkable instances of electric light, playing like the *aurora borealis*, at an altitude of 20° above the horizon. One evening, October 4th, I observed an arc of light which remained permanent, with a tremulous motion, for the space of twenty minutes; a strong gale of wind was blowing at the time: it was of a pale yellow colour, and flashes of lightning frequently appeared beneath it. Meteors or falling stars are very rare, and earthquakes are scarcely known here."

II.—OF THE TIDES.

The FOLLOWING DESCRIPTION of the TIDES commences with the Northern Coast of Brasil, from East to West; it thence proceeds with the eastern coast of the same, from North to South, and downward to the River Plata.

NORTHERN COAST OF BRASIL.—We are, as yet, but imperfectly acquainted with the tides on this coast, but the following remarks will serve to show that the time of flowing, or high water, is progressively later from East to West. At the entrance of the Jaguaripe or Aracati River, near the meridian of 38° W., the time of high water, on the full and change days, is about 5 h. Spring-tides here rise 8, and neaps 4 feet. The highest tide is two days after the full and change. The flood-stream outside sets constantly to the N.W. along shore, but is seldom stronger than two-thirds of a mile in an hour.

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* Voyage of the Chanticleer, Vol. II. p. 60.

† Idem, Vol. II. p. 26.

In the *Bay of Seara*, and coast next westward, very little tide is perceptible: but, between the *River Perguizas* and *St. Anna's Isle*, near Maranham, there is a regular flow, setting directly on the coast, and which runs an hour longer than the ebb. It has been conjectured that there may be here an under-tow, always running to the westward. In the *Bahia or River of St. José*, on the East of Maranham Island, the tide sets with great strength: the flood from E.S.E., the ebb from W.N.W. High water at about 6 h. *p.m.*

From off the Isle of Santa Anna the flood sets to the S.W. into Maranham Bay; its rate in the offing is commonly more than half a mile in the hour; but, on advancing, its strength increases. In the harbour of Maranham the tide makes at least half an hour before it does outside. High water at about 6 h. 20 m.

At the Island of St. Joaõ, or St. John, the tide runs very strongly N.E. and S.W. High water at about 6 h. 24 m. *p.m.*

Navigators leaving Maranham, for the coast to the westward, have been advised to take three or four days after the full and change of the moon for the time of starting; as the spring-tide, at times, previously runs at the rate of four miles an hour.

Between St. Joaõ and Salinas (long. 47° 15′) Captain the Hon. W. Wellesley, in H.M.S. *Sapphire*, found a strong easterly and south-easterly stream running off the shore. Whenever the *Sapphire* was at anchor hereabout, the flood was found to set S.E., and the ebb East. The pilots say that this is always the case from December to May or June, owing to the heavy rains. The *Pickle*, schooner, ignorant of this particular, was set back from Atasia to the Bay of Turivazo, a distance, eastward, of nearly 40 leagues, and was unable for some days to make head against it. A French brig of war was likewise set in the same direction.

Near Salinas, during the rainy season, from September to May, the tide along the coast has been found constantly setting from S.E. to East. Between this and the *Rio Para*, the tides run very strong, and are very uncertain in their direction, owing to the numerous small rivers and banks in the vicinity, and more especially to the streams of the great River Maranon, which affect them on the West. High water at Salinas about 8 h.

On the *Braganza Bank*, off Point Tigioca, the time of high water appears to be from 10 h. to 10 h. 30 m. At Para it flows at 12 h. 5 m. *p.m.*, and vessels carry a regular tide up the river. In the port the tide runs with great strength, and without the river, to the N.W., the ebb stream runs strongly, until it is blended with those from the Maranon, which set more to the North.

EASTERN COAST OF BRASIL.—We now revert to the *Eastern Coast of Brasil*, from Cape St. Roque southward, and find that, at Pernambuco and Bahia, or St. Salvador, the time of high water is 4 h. 45 m., and rise from 6 to 8 feet. In the harbour or port of Cape Frio, the time is 1 h. 40 m., and the rise only 4 feet. In the channel, within the island of St. Sebastian, the time has been given as 2 h. 30 m., but the rise and fall here is scarcely perceptible, at least not regularly so, and the current sets according to the wind. Hence the tide at Rio Janeiro is so little, that it seems to have almost escaped notice; but Captain Owen gives it as 2 h. 40 m., and rise 4 feet.

Within the Harbour of ST. CATHERINE the ebb and flood are very unsettled, and seem to depend almost entirely on the wind. The flood sets in from the north, the ebb from the south; and, as the wind is almost always from the sea, the ebb, with a fresh northerly wind, is scarcely apparent, and seldom lasts more than two or three hours. The time of high-water, at new and full moon, has been given at 2 h. 30 m., and the rise six feet.

In the RIVER PLATA, likewise, there do not appear to be regular tides, but Currents, as uncertain in their duration as they are irregular in their rate and direction. In fine, settled weather, with moderate winds, a rise of 5 or 6 feet has, however, been found here.

III.—OF

III.—OF THE CURRENTS.

The currents of the Atlantic Ocean, northward of the Equator, in connexion with those to the southward of it, have been explained in the *Memoir*, &c. on the Atlantic Ocean, and we have the satisfaction of finding that various experiments since made have fully confirmed the previous explanation: more especially of the *Equatorial Current*, setting westerly from the vicinity of the line, along the north coast of Brasil, and thence into the Caribbean Sea. The inner edge, or southern border of this stream, appears to blend with the flood-tide setting westward, while the ebb, in a great part of the way, sets in a contrary direction along the shore, from West to East.

Between the meridians of 40° and 45° W., and the parallels of 1° and 4° N., the Equatorial Current has been found to set from N.W. to North; and [in September] N. by E.; and the northerly current has been described to prevail from longitude 40° to the coast, in the parallels of 2° to 5° North, so as to make it requisite, for those proceeding westward, to adopt, from May to October, a S.W. course, and from October to May, a W. S.W. course, in order to preserve the parallel.

H.M. ship *Sapphire*, on a cruise on and near the Line, found the Equatorial Current setting W.S.W. to W.N.W., but much weaker in longitude 37° than in 43°; its greater strength being nearest to the land. In the month of April, 1815, it was found by the officers of H.M. ship *Leonidas*, near the meridian of 40°, and south of the Line, setting in these directions from 28 to 50 miles in the twenty-four hours; its greatest strength being in latitude 1½° South, and toward the coast.*

In June, 1830, on the Equator, and in longitude 40°, Captain Geo. Cheveley found a strong current N.N.E. of a mile and a quarter in the hour: a proof of its variable directions, according to the season.

In rounding the point north of Cape St. Roque, between Pernambuco and Seara, the current was tried by the same commander, and found to set three miles an hour, taking off in a westerly direction, and decreasing to one mile an hour on approaching Point Macoripe. In the Bay of Seara the current set W.N.W., from one half to three-quarters of a mile in the hour.

It appears from the preceding facts, that, although the current in the outer offing, by which is to be understood the EQUATORIAL CURRENT, generally sets to the W.N.W. and N.W.; yet here the phenomenon of parallel streams, flowing in opposite directions, is to be found. It is now clear that, within the inner edge or border of the Equatorial Current, the stream of the Tide and the in-shore Current, blending more or less, are variable; and the stream does not *always* set to the westward along the coast, as may have been supposed. Captain Livingston informs us that, in 1824, he found it setting strongly to the westward, near the meridian of 38° W., or eastward of SEARA, or where the *Inconstant* frigate, 1st of April, 1814, (as shown by chart,) was set N. 73° W., 47 miles in twenty-four hours. But, on proceeding next day, from Jericoacoara to the westward, the vessel was much retarded by an easterly stream, with a little inclination to the southward.

"Ours," says Captain L., "was not a solitary instance; as I have heard many persons describe how they have been deceived by allowing for a westerly current; though all the old traders at Maranham own that, at times, and I think more frequently than otherwise, it sets to the westward." All this, however, may easily be accounted for, when the course and operation of the tides are known.

The Central part of the Ocean, north of the tropic of Capricorn, is under the immediate influence of the S.E. trade wind, which impels its surface waters to the westward. This immense drift sometimes reaches nearly home to the Brasilian shores; but, on approaching those shores, it appears more frequently to form a *stream* current, setting, in a counter-direction, along shore to the *southward;* and which is said to have been traced nearly from Pernambuco to Tierra del Fuego; but circumstances prove that it is variable, and always modified by the prevailing winds.

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* From the Island of Ascension, so famous as a nursery of turtles, many young ones, of the best quality, are carried by the Equatorial Current to the West Indies.

From the River Plata there is commonly a great outfall of fresh water, which has been traced many leagues to the eastward, and which is lost in the variable currents found between the *westerly* or Central Drift, on the North, and a wide *easterly* current, commonly prevailing between the parallels of 30° and 35° to 40° S.* The last, denominated the SOUTHERN CONNECTING CURRENT, greatly facilitates the passage of ships bound to Australia and to ports of the Indian Ocean.

The BRASILIAN CURRENTS.

On the Eastern Coast of Brasil the Stream Currents are varied according to the direction of the winds or monsoons and the inclination of the coast. The *Baron Roussin* says, " As the winds do not impede the navigation of these coasts, neither do the currents. They generally follow the winds, according to their force and direction; for there is no river between Maranham and the Isle of St. Catharine powerful enough at its mouth to carry with it any sensible motion into the sea to more than one or two leagues from the coast. The winds are variable; so are the currents; their change is very quick. In these warm seas the waters are very clear, and they are disturbed by the first impulse given them. At the end of 24 hours, if the breeze be strong, you may observe a current running in the same direction. After a great number of observations on the currents, we have estimated, more or less, their velocity along the coast, from the island of St. Catharine to Pernambuco, at six-tenths of a mile an hour in the two monsoons; it is often under that quantity, rarely above it; sometimes nothing. The velocity of the currents is more considerable in the southern monsoon than in the northern, because the wind is stronger in the first instance than in the other.

" But the velocity varies on different parts of the coast. Between the parallel of the Island of St. Catherine and that of the Abrolhos, or 18° S., and from two to ten leagues from land, the current is hardly to be discerned in any season. From the 18th to the 11th degree the waters carry you to the N.W. during the Southern monsoon. From the 11th to the 9th degree it sets to the N.E. in the direction of the coast, quickening its motion. Passing the 9th degree, in proceeding northward, the waters carry you to the northward with greater velocity, which increases at times to the rate of 36 miles in the 24 hours, and is seldom less than 20. To the N.W. of Cape St. Roque, it sometimes sets at the rate of 48 miles per day, the waters running W.N.W. in the direction of the coast.

" On passing Pernambuco, and in following the land to the northward, the currents and monsoons can rarely have any influence of consequence to navigation. More to the southward their effect is greater, and they may be considered as tides; these again are not important, as they do not extend far from land, and only affect vessels going to the small ports or creeks on the coast. Most of the great ports are subject to the regular Tides.

" Adverting to what has been said on the winds and currents off the coast of Brasil, we must conclude, first, that between the isle of St. Catharine and Olinda, or Pernambuco, there is no permanent obstacle against navigation; and the recommendation to make the land to windward of the place you are going to, is a matter of precaution to preserve yourself from all disappointment. Secondly, from the point of Olinda, all along to Cape S. Roque, and thence to the isle of Maranham, prudence dictates that you should keep to the eastward of the point you would arrive at, after compensating in the track the effect of the currents carrying you to the W.N.W."

Captain Hewett says, During the southerly monsoon, the currents to the southward of Cape St. Augustin are not so powerful as to the northward, where they increase in strength until the months of June and July, and then gradually decline. On the contrary, in the northerly monsoon, they are generally very strong to the southward of Cape St. Augustin, when they are weak to the northward, as they have some difficulty in detaching themselves from the stream, which runs from the S.E. trade around Cape St. Roque.

Mr. Lindley also notices that, " A strong current runs southward from Cape St. Augustin, commencing about the middle of October, and continuing until January; after which there is no particular current till the middle of April, when a powerful one sets in northerly till July, and then subsides in like manner."

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* In the parallel of the Rio de la Plata (December, 1823,) although 200 miles from land, we were daily carried by the current 39 miles out of our course toward the S.E.; so great is the influence of this mighty river at the distance of 240 miles from its mouth.—*Kotzebue.*

The currents of the River Plata, and other local currents near the shores, will be noticed hereafter.

Extracts *from* Remarks *on the* Currents *between the* Coasts *of* Guinea *and* Brasil, made by Captain Edward Sabine, F.R.S., in 1822.[*]

The Current, called the *Equatorial Current*, commences much farther to the eastward than is commonly imagined: and it appears, that the island *Anno Bon* is always surrounded by it; while *Prince's Island* is equally surrounded by the *Guinea Current*. *St. Thomas's*, being in an intermediate situation, the sea around it is occasionally influenced by both.

In consequence of the southing of the trade-wind in the vicinity of the continent of Africa, the water impelled before it, which forms the commencement of the Equatorial stream, arrives from a more remote southern parallel, and is, therefore, of a cooler temperature than the drift water which successively falls into it from the S.E., impelled more obliquely to the meridian, and consequently arriving from latitudes less distant from the Equator. Thus the temperature of the stream varied from 72½ to 74°, whilst that of the drift current was 77½ and 78°.

But the more important distinction, both in amount and in utility in navigation, is between the waters of the Equatorial and Guinea Currents. These exhibit the remarkable phenomenon of parallel streams, in contact with each other, flowing with great velocity in opposite directions, and having a difference of temperature amounting to ten or twelve degrees. Their course continues to run parallel to each other, and to the land, for above 1000 miles; and, according as a vessel, required to proceed along the coast in either direction, is placed in the one or the other current, will her course be aided from 40 to 50 miles a-day, or retarded to the same amount.

On the Brasilian Side, from Pernambuco to Cape S. Roque, the northerly current rapidly accelerated, until, in passing the Cape, it may be considered that the *Pheasant* had entered the full stream of that branch of the Equatorial Current which pursues its way along the northern coast of Brasil and Guyana to the West-Indies. Between the noons of the 16th and 17th of July she was set 44½ miles to the North, and 42½ to the West; making a general effect, in the 24 hours, of N. 44° W. 62 miles: probably more northerly in the first part of the interval, and more westerly in the latter, than the general effect.

On the day after the Pheasant sailed from Maranham, she entered the current, the full strength of which she had quitted to go to that place, and it was then found to be running with the astonishing rapidity of 99 miles in 24 hours. On the 10th of September, at 10 A.M., while proceeding in the full strength of the current, exceeding four knots an hour, a sudden and very great discolouration of the water a-head, was announced from the mast-head; the ship being in 5° 8′ N. and 50° 28′ W. (both by observation), it was evident that the discoloured water could be no other than the stream of the Maranon, pursuing its original impulse at no less than 300 miles from the mouth of the River, its waters not being yet mingled with the *blue* waters of the ocean, of greater specific gravity, on the surface of which it had pursued its course. It was running about 68 miles in 24 hours.

BRASILIAN CURRENTS, CONTINUED.—In the brig *Mary Brade*, on her homeward passage from Rio Janeiro, May 20 to 28th, 1823, Captain J. W. Monteath found the currents, &c. as follow:—

In latitude 3° 51′ N., long. 25° 30′, weather variable and squally, with rain throughout.

In 2°	33′	N.	25°	5′	W.	Current West, 29 miles.
0	14	N.	25	27	—	The same, 22 miles.
2	3	S.	25	43	—	The same, 30 miles.
4	29	S.	26	23	—	S. 77° W. 27 miles.

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[*] The Remarks at large are given in the "Directory for the Ethiopic or Southern Atlantic Ocean."

In 6° 53′ S.	27° 19′ W.	Current S. 72° W. 41 miles,
8 50 —	— —	in 48 hours.
10 18 —	28 23 —	S. 72° W. 12 miles.
12 8 —	29 7 —	S. 68° W. 18 miles.
13 56 —	29 40 —	S. 54° W. 25 miles.

In December, 1825, Captain Monteath, homeward bound, found the Currents as follow:—

Lat. S.	Long. W.	Wind.	
7° 14′	34° 42′	East to E.S.E.	N. 82° W. 21 miles.
8 14	34 50	E.N.E. to E. by N.	S. 36° W. 22
8 58	34 53	E. by N. to N.E. by E.	S. 68° W. 26
9 1	35 1	E. by S. to E.N.E.	S. 15° W. 15
9 23	35 21	E.S.E. to East	West 14
9 44	35 41	E. by N. to E.S.E.	S. 72° W. 25
10 15	35 50	E. by N. to East	West 10
10 51	36 0		Not perceptible.
14 45	35 51	N.E. to E. by N.	S. 20° W. 20
13 55	37 10	N.E.	S. 9° W. 13
14 47	36 12	At noon, Dec. 9.	

In February, 1824, on his passage from Valparaiso, in Chilé, to Rio Janeiro, Captain Monteath experienced the Currents as follow:—

In 27° 13′ S.	long. 39° 12′	Current South, 18 miles.	
31 46 —	39 33	S. 80° E. 12 miles.	
32 38 —	41 45	East, 28 miles.	Stream of La Plata.
34 3 —	43 59	East, 30 miles.	
39 45 —	47 58	South, 22 miles.	
40 47 —	47 32	South, 20 miles.	
40 34 —	47 54	South, 20 miles.	

On a second voyage in 1824, on Dec. the 30th, in latitude 37° 29′ S. long. 45° 8′ W. the current was found to have set N.E. ¾ N. 43 miles in the 24 hours. Next day, lat. 38° 24′, long. 46° 40′ N.E. by E. ½ E. 34 miles.

In latitude 40° 20′, long. 48° 22′, 11th of January, 1824, Current N.N.W. 24 miles. Temperature of the water, on the surface, 69°; at the depth of 120 fathoms, 62°. *No variation of the compass.*

V. PASSAGES from EUROPE and from NORTH AMERICA to the PORTS of BRASIL.

A commander bound from the Land's End of England to the coast of Brasil, should, in the first instance, as in all other cases, attend to the aberration of his compass, according to the local attraction of his vessel, in order to be assured, as nearly as possible, of a correct reckoning; and then, making due allowance for the current or tide setting northwestward, athwart the English Channel, and the inset from the W.N.W., into the southern part of the Bay of Biscay, he should pass Cape Finisterre at the distance of 90 or 100 miles. He may thence steer toward the island of Porto Santo or Madeira, making a large allowance on his way for the current setting eastward, toward the Strait of Gibraltar, and southeastward toward the shores of Marocco, and still more southerly toward the coast eastward of the Canary Islands.

If bound to Seara or Maranham, and it be not necessary to touch at the Port of Funchal, the best passage will be made, and much time saved, by passing to the westward of Madeira, the Canary and Cape Verde Islands, at a sufficient distance to avoid the calms produced by the high lands; as in this route steadier winds may be expected than those generally prevalent close to or among the islands.

On entering the parallels south of the Cape Verde Islands, he will still be assisted by the N.W. trade wind, which may probably have commenced in the parallel of 30° or thereabout, and which will cease, according to the season, in from 12° to 3° north of the Equator: but here, crossing the line in about 33° W., the ship will be farther assisted by the Equatorial Current, and may make her port as shown in the Directions hereafter.

The various circumstances which control the route, northward of the Line, are fully explained in the second section of our Memoir on, and Instructions for, the Atlantic Ocean, in which the Winds and Currents are described. The trade winds, on the African side of the Atlantic, will, as shown in that volume, commonly be found to commence in the parallel of 26° N., and in the summer, even in 30°.

To those who have not the work above-mentioned to refer to, the following extracts may be acceptable.

The Equatorial Limits of the N.E. Perennial or Trade-wind between the meridians of 18 and 26 degrees West, have been found, upon the comparison of nearly 400 journals, English and French, to vary considerably, even in the same months of the year. We have shown on the Chart, where the N.E. Trade, according to the probable mean, may be expected to cease in the different months: but the annexed Table will be found to answer the purpose more precisely.

In this Table the columns of *Extremes* show the uncertain termination of the Trade-winds, as experienced in different ships. The annexed columns show the *Probable* Mean: and the last column exhibits the mean breadth of the interval between the N.E. and S.E. winds.

Thus, the Table shows that, in the month of January, the N.E. trade has been found sometimes to cease in the parallel of 10°, and sometimes in that of 3° N. That the probable mean of its limit is about 5° N.—That the S.E. trade, at the same time, has been found to cease sometimes at only half a degree North of the line, and sometimes at 4 degrees. That the probable mean of its limit is, therefore, two degrees and a quarter. And, that the interval between the assumed means of the N.E. and S.E. Trade-winds is equal to 2¼ degrees: and so of the rest.

TABLE *showing the* EQUINOCTIAL LIMITS *of the* N.E. *and* S.E. TRADE-WINDS, *between the* MERIDIANS *of* 18 *and* 26 DEGREES WEST.

N.E. TRADE-WIND.			S.E. TRADE-WIND.		INTERVAL BETWEEN.
CEASES,	General Extremes.	Probable Mean.	General Extremes.	Probable Mean.	Mean Breadth.
In January at ··	3° to 10° N.	5° N.	0½° to 4° N.	2¾° N.	2⅓ degrees.
February ····	2 to 10 —	4 —	0½ to 3 —	1¼ —	3¼
March ······	2 to 8 —	4¾ —	0½ to 2½ —	1¼ —	3½
April ······	2½ to 9 —	5 —	0 to 2½ —	1¼ —	3
May ········	4 to 10 —	6½ —	0 to 4 —	2½ —	4
June········	6½ to 13 —	8½ —	0 to 5 —	3 —	5½
July ········	8½ to 14 —	11 —	1 to 6 —	3½ —	7½
August ······	11 to 15 —	13 —	1 to 5 —	3¼ —	9¾
September····	9 to 14 —	11½ —	1 to 5 —	3 —	8½
October······	7½ to 14 —	10 —	1 to 5 —	3 —	7
November····	6 to 11 —	8 —	1 to 5 —	3 —	4¼
December····	3 to 7 —	5½ —	1 to 4½ —	3¼ —	2¼

In the space of variable winds between the trades, exhibited in the last column, it has been found, that southerly winds prevail more than any other: more particularly when the sun has great northern declination. Homeward-bound East-India ships are therefore enabled, at this season, to cross the space more quickly than those outward-bound; which they do, in some degree, at all other times. Yet calms and variable winds are experienced in every month of the year, within this space; but the former, which are more generally in the vicinity of the N.E. trade, seldom continue long. These calms are frequently succeeded by sudden squalls; against which every precaution should be taken; as many ships have lost their topmasts, and have been otherwise damaged by them. Whirlwinds have sometimes accompanied these squalls in their first effort against the resisting atmosphere.

It has been stated as probable, that a gale of wind, or storm, never happens hereabout far from land, or near the equator in the open ocean, on any part of the globe; although, in its vicinity, sudden gusts of winds and whirlwinds are sometimes experienced. S.W. and W.S.W. winds, with much rain, are frequent in July, August, and sometimes in June and September.

The heated land of Africa within Cape Verde, with the Cape Verde Islands, produce in the vicinity the variable winds, and occasional calms, which counteract the trade-wind to a considerable distance from the coast. Hence it happens, that ships, which approach too near the coast or islands, lose the trade-wind sooner than those which keep at a greater distance. To guard against this, it has been recommended to commanders to keep well to the westward when the N.E. trade fails; but some, in observing this precept, have crossed the line too far to the west; for, meeting with the S.E. trade, hanging far from the southward, with strong westerly currents, they have made the coast of Brasil, and been obliged, in consequence, to tack to the eastward.

PASSAGE from NORTH-AMERICA or the WEST-INDIES.*

Vessels bound from America or the West-Indies to a port of the Northern Coast of Brasil, are directed to make, and take a departure from, the *Bermudas*, as the remotest point on that part of the course eastward. The most favourable time of the year is in the winter season, or from November to March, because strong *westerly* winds, then prevalent, will enable them to proceed so far eastward as to make a fair wind of the N.E. trade, should they obtain it.

Leaving the Bermudas, a due East course should be made, inclining rather northerly, and so as to be sure of not getting too soon into the Trade, which extends, in summer, nearly as far as Madeira.

The winter months are, also, the best for making the coast; the weather, although rainy, being clear; the winds so moderate, that any part of the coast is safe to anchor on; and the currents are reported to have less strength than in the summer season.

Having attained the longitude of 46° on the parallel of 30° N., steer a S. by E. course, in order to get through the variables as soon as possible. These extend, in the winter months, over a much smaller space than at other seasons. The variation will keep the ship gaining to the eastward, and the Trade-wind will allow her to be hauled up a point or two, should it be found necessary. Having the advantage of this wind, a course must be assumed which shall bring you to the Equator under the meridian of 40° W., if bound to Maranham, and proportionally more to the eastward if bound to a port more to the east.

But Captain Wellesley says, If the passage be made in the summer time, it will be better to keep, if possible, well to the northward and eastward until 40° W. is attained, in case variable winds should be met with, and the ship be driven to the westward. H.M.S. *Sapphire* experienced no perceptible current until near the Equator, when a slight westerly one was found, unless a wrong allowance was made for variation, which was found to decrease rapidly on advancing to it. It is to be borne in mind, also, that the variation changes from West to East at a little to the northward or on the Equator. The English traders to Maranham cross the Line generally in from 40° to 42°, and this enables them to steer more directly for the land; whereas if it were crossed in 38°, a course must be adopted not very different from the trend of the coast; and then, should a westerly wind spring up, embarrassment might ensue.†

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* By Capt. the Hon. Wm. Wellesley, R.N.

† Nautical Magazine, 1833.

PASSAGE to the EASTERN PORTS of BRASIL.

In the year 1820, Mr. Cubitt Springall, in the brig *Patty*, made a voyage to Pernambuco; and in adverting to this passage, he says, "I crossed the Equator on the 24th of May, in longitude 25° 26′. This I am aware, from experience, is the best track for a vessel bound to the eastern coast of Brasil; or say from 25° to 28°. On the second day after crossing the line, in lat. 2° 36′ S. we found, by observations taken by three quadrants, that the ship was from 40 to 50 miles to the southward of her reckoning, which, of course, was attributed to a current in a S.S.W. direction, which continued with the track of the ship to latitude 6° 36′ S. longitude 28°; then I found, by good observations, the current set equally as strong to the northward. On standing in, to make Pernambuco, with the southerly wind, which prevails from March to August, and being under the necessity of bringing up, I found the current to run at the rate of three and a half knots N.N.W. This was in five or six fathoms of water, about 30 miles to the northward of Pernambuco. The southerly current, which prevails from September to March, when the wind is from the northward, is not so strong as the northerly current.

"I sailed from Pernambuco on the 1st of August, and re-crossed the line on the 6th, in longitude 29° 36′, and found a stronger northerly current till in latitude six degrees North, which set the ship constantly to the northward and westward from 25 to 30 miles per day."

Mr. John Luccock, in his valuable and important volume on the Geography and Navigation of Brasil,* has the following remarks on the passage, which may be advantageously compared with those above:—

"After passing the Cape Verde Islands, the mariner, who is bound to the southward, feels anxious about crossing the line. Landmen, not aware of the circumstance, will probably be surprised to hear that, broad as the ocean is between the coasts of Africa and Brasil, a difficulty exists in clearing Fernando Noronha and Cape St. Augustin. With a good chronometer on board, I should run boldly on toward the American coast, being careful only to avoid falling to leeward of Cape St. Roque, and into the heavy current which sets close around it. Without a chronometer, or knowledge enough to use it with advantage, I should allow, from 17 degrees of north latitude, a westerly drift, beginning with five miles for 24 hours, increasing the allowance until the latitude of five degrees be attained, when it should be at least 20 miles a day. From that parallel to 13 degrees South, the drift will decrease, and then again become variable. If nine degrees South can be obtained, without seeing the land, the navigator may generally proceed with confidence, even close inshore, particularly in the months from October to March; for the daily land-wind will carry him sufficiently out, while it blows, to render his passage easy and safe when the sea-breeze returns; and close to the land he will find fewer calms, than at the distance of 30 to 50 miles from it. Upon the coast of Brasil, it may be taken, almost as a general rule, that the sea-breeze blows nearly at right angles to the line on the shore, reckoning from cape to cape; within the bights it frequently fails, and even strong south-westers do not always blow home. The period of the year which has been mentioned as most favourable for running down the coast of Brasil, differs, I am aware, very considerably, from the opinions which prevail at the British Post-office; yet, when speaking of commercial affairs, I hope to prove that these months are best adapted for such a purpose. The allowances too, for drift, which have been explained, it is obvious, ought to be influenced, in some measure, by accidental circumstances; the most important are the place where, and the direction in which, we cut the current. The advice given above is most applicable to cases where the equator is crossed in about 29 degrees of longitude, and the course steered directly upon St. Augustin. The cause of this mighty current, or marine river, is now well understood; but its strength, and, in some measure, its direction, which the navigator should carefully observe, depend upon the winds which have blown between either tropic and the line.†

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* "Notes on Rio de Janeiro and the Southern Parts of Brasil; taken during a residence of ten years in that country, from 1808 to 1818." 4to. London, 1820.

† A just idea of the nature of the Equatorial Current will prevent a commander from crossing the equator too far to the westward in the southern passage; particularly at the season when the S.E.

"They are not so steady as has been sometimes represented, and seem to be very materially affected by the relative positions of the sun and moon. It is evident that both these luminaries produce a tide in the atmosphere; and sometimes counteract each other's influence. This occurs, in the smallest degree, when the new and full moons happen with the least difference in the declinations of the two bodies. In proportion as this increases, their operations on the air become disturbed; and every month, a vessel, within the tropics, must be placed, unavoidably, between the foci or points upon which their influence most immediately falls. In such a situation, she will probably meet with calms. The winds will freshen continually in proportion as the moon approaches and passes over her, or recedes and leaves the influence of the sun more predominant. Hence, it seems that, the irregularities of the trade-winds, so frequently noticed, and especially of the south-eastern trades, may be connected with the cycle of the moon, and return periodically. An attentive officer observes such circumstances, and endeavours to make use of them."

Whatever may be the anomalies or particular exceptions to the more general or predominant direction of the winds and currents, it is to be remembered that, "in whatsoever line or direction a portion of the current may move, it must rarely happen that it is neutral in respect of a ship's course; but that, on the contrary, it will either favor or impede it."

M. de Humboldt has noticed that, in the year 1803, several vessels bound from Cadiz to the Caraccas were forced to lie-to, in the 14th degree of North latitude, and the 46th of longitude, on account of a very violent wind, which blew for several days from the N.N.W. He adds, "What extraordinary interruption must we suppose in the play of the aërial currents to explain such a cross wind." Such anomalies as these serve, in some measure, to account for partial and contrary streams of water on the ocean.

PASSAGE of his Majesty's ship BLOSSOM, Captain Beechey, from TENERIFE to RIO JANEIRO, June 3 to July 11, 1825, passing to the westward of the Cape Verde Islands.

"In June 1825, his Majesty's ships *Wellesley* and *Bramble* sailed from Santa Cruz for Rio Janeiro, and three days afterward the *Blossom* departed for the same place. About the same time the packet, the *Hellespont,* and another merchant-vessel, made the passage from England. The Bramble crossed the Equator in 18° W., the Wellesley in 25° W., the packet in 29½° W., the Blossom in 30° W., the Hellespont in 32° W., and the merchant brig, of which I shall speak presently, in 39° W. The Hellespont, which sailed indifferently, was 46 days, the packet 46 days, the Blossom 36, the Wellesley 45, and the Bramble 48 days. Thus, making a reasonable allowance for the distance between England and Tenerife, the Hellespont made the best passage, the packet and Blossom the next, the Wellesley next, and the Bramble the worst; by which it appears that, in proportion as the vessels were to the westward the passages were shortened." The merchant brig, however, was too far to the westward, as she could not weather Cape S. Roque, and, like the *King George,* Indiaman,[*] she was obliged to stand back to the variable winds to regain her easting, so that her passage occupied 110 days.

This passage is so frequently made, that remarks upon it might be thought almost superfluous; but I am not disposed to undervalue this sort of information, which is in general too much neglected. There is no doubt that the route from England to Rio Janeiro ought to be varied according to the time of the year; for, even in the Atlantic, the trade winds are affected by monsoons, and it is only by a long series of observations that we can ascertain at what time of the year it is advisable to cross the Equator in any particular longitude. The journals of the packets for one year would afford valuable information on this subject. In the passage of the *Blossom* we carried the N.E. trade from Tenerife to 8° N., and met the S.E. wind in 5° 30′ N. and 25° 50′ W., which carried us to Cape Frio. The trades were steady, and in the northern hemisphere fresh.

From the time of leaving Tenerife until we lost the N.E. trade, the current set S. 54° W. 115 miles in ten days, or at the rate of 11½ miles per day.[†] With the change of wind

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trade-wind is very far southerly; and when, also, the current runs so strongly to the westward, in the vicinity of Cape St. Roque, as to hazard a vessel's being driven to the leeward of it.

[*] See our Atlantic Memoir, 7th edition, page 150.—ED.

[†] According to the classification of currents, given in the Memoir on the Atlantic, this must be the 'Drift Current from the N.E.,' combined, in its southern borders, with the '*Equatorial Stream.*'—EDITOR.

occurred an immediate alteration in the direction of the current, and the next twenty-four hours we were set N. 86° E. 23 miles. The meeting of the currents was marked by rippling of the water, which could be seen at a considerable distance. The four succeeding days the current ran between S. 45° E. and S. 89° E. at the average of thirteen miles per day.* During this time we changed our position from 7° 21′ N. latitude, and longitude 26° 58′ W. to 3° 56′ N. and 26° 44′ W., and had the S.E. trade one day. We now got into a strong N.W. current, which ran between N. 58° W. and N. 72° W. at an average rate of 22½ miles per day, until we made Fernando Noronha.†

From Fernanho Noronha the current changed its direction, and ran between S. 78° W. and S. 21° W. at an average rate of 27 miles per day, until 100 miles due East of Cape Ledo.‡ We stood on to the southward; and as we neared the land about Cape Augustin, the velocity of the current abated, and our daily error was reduced to seven miles S. 52° W.; but as we drew off the land, still continuing to the southward, the current again increased, and became variable. The first hundred miles from Cape Augustin it ran S. 87° W. 26 miles; the next due South, 27 miles; the following S. 76° W. 21 miles; and then S. 80° W. eleven miles, until our arrival off Cape Frio, when the whole amount of current was 274 miles S. 57° W.

From this it appears that the N.E. trades propelled the waters in a S.W. by W. direction, at the rate of 11½ miles per diem; § and the S.E. trades to the W.N.W., with double the velocity, or 22½ miles per day; and that in the intermediate space, where light variable winds prevailed, there obtained a current, which ran in a contrary direction to both these, at the rate of 13 miles per day.

It appears, from numerous observations, that in both hemispheres, the rate of the current || is accelerated on approaching the Gulf of Mexico; and as my route was rather more to the westward than that generally pursued, the above-mentioned average-rates are greater, probably, than will be experienced under ordinary circumstances.

(*Capt. Beechey's Appendix, pp.* 628, 9.)

REMARKS ON SAILING WESTWARD of the CANARY ISLANDS, between the CAPE VERDE ISLANDS, and toward the EQUATOR, by *Captain J. W. Monteath,* in the *Mary Brade,* from Liverpool toward Cape Horn, April, 1823.

April 2, 1823, at 4 *p.m.* the island *Palma* was in sight, bearing from S. 25° W. to S. 78° W., distant about five leagues; next morning, at 7 *a.m.*, the island *Ferro* was in sight, bearing S.E. by E.

We carried fresh and fair winds from N.E. to East, with a prevailing westerly current, until the afternoon of the 7th, when S. Antonio, the north-westernmost of the Cape Verde Islands, was discovered at 5 h. 30 m.: the N.E. point bore S. 40° W., distant about five leagues, and the N.W. point S. 66° W., distant 8 leagues.

At 8 *p.m.* shortened and hauled by the wind under easy sail, tacking ship every two hours to preserve our position, as I intended at day-light to run through the channel between S. Antonio and S. Vincent, in preference to running to the westward of the former island. The wind, notwithstanding our vicinity to the land, continued steady from North and north-eastward during the night.

At 5 h. 30 m. *a.m.* bore up under all sail. The wind, as we drew near the high land of

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* The incipient portion of the Current which sets thence eastward along the coast of Guinea. 'During the African S.W. Monsoon, from June to October, a great portion of the Equatorial Stream is diverted to the North, N.N.E. and N.E. even to the Cape Verde Islands.'—See Memoir, 7th edit. page 152.

† In the *Equatorial Current,* see the present work, page 8.

‡ The Brasilian Current, setting to the S.W. See page 9.

§ All the rates are averages.—*Original Note.*

|| That is to say, the *Equatorial Current.*—ED.

of S. Antonio, veered round to the N.W.* until we had fairly entered the channel, when it hauled gradually round to the N.E. and E.N.E., and continued to blow steady from that quarter until clear of the islands.

I have now to remark that this is the third time I have passed in the vicinity of these islands: in August, 1812, on a voyage to Rio de Janeiro; in February, 1818, on a voyage to Calcutta; on both of these voyages I passed close to the westward of St. Antonio, without being becalmed, and also this voyage, having carried the trade-wind steady through the channel to the eastward of it. In future, if I have occasion to pass this way, I shall, in case the weather be clear, and a sight of the N.E. point of St. Antonio be obtained before dark, have no hesitation in running through the channel at night, with the greatest confidence, as there are no dangers except close in-shore.

We carried the breeze strong, all night of the 8th, from East; at day-light the islands of Fogo and Brava were in sight; the centre of Brava bearing E. ½ S. by compass. At 19 h. 15 m. the mean longitude, by four chronometers, was 25° 6′ 34″ W.; the north end of Brava bearing N. 53° E., and the south end N. 73° E. by compass. At 10 *a.m.* we were partially becalmed, having hauled up rather too near Brava; which island, from its height, intercepted the sea-breeze: during this interval I lowered the boat, in order to ascertain the velocity and direction of the current; it was found setting N. by E. at the rate of 30 miles in the 24 hours; there being no bottom at the depth of 80 fathoms. At noon the latitude by observation was 14° 38′ N., the N.W. point of Brava N. 25° E., the S.E. point N. 43° E.; the peak of Fogo N. 65° E. Angle of elevation of the Peak, 2° 14′. The number of the *Holothiena Utriculas* (Portuguese Men of War,) was immense, and the sea completely discoloured with different kinds and sizes of the mollusca tribes. On the 8th of April, at sun-set, we bade adieu to the Cape Verde Islands; the variation, by amplitude, being observed as 14½° W.

Remarks on Sailing Westward of the Canary and Cape Verde Islands, and toward the Line. *By Captain M. Flinders*, 1801.

"At day-break, 9th August, 1801, the island Palma was in sight, bearing S. 72° E. *true*, 10 or 12 leagues. Albacores and bonitas now began to make their appearance, and the officers and men were furnished with hooks and lines, and our harpoons and fizgigs were prepared. This day I ordered lime-juice and sugar to be mixed with the grog; and continued to be given daily to every person on board until within a short time of our arrival at the Cape of Good-Hope.

"We carried fair, and generally fresh, winds until the 15th, in the morning, when St. Antonio, the north-westernmost of the Cape Verde Islands, was in sight. At eight o'clock the extremes bore N. 69° E. and S. 13° W., *true*, and the nearest part was distant four miles; in which situation no bottom could be found at 75 fathoms. A boat was observed near the shore, and our colours were hoisted, but no notice appeared to be taken of the ship.

"The north-west side of St. Antonio is four or five leagues in length, and rises abruptly from the sea, to hills which are high enough to be seen fifteen or more leagues from a ship's deck. These barren hills are intersected by gullies, which bore marks of much water having passed down them. By the side of one of these gullies, which was near the place where we lost sight of the boat, there was a path leading up into the interior of the island. The S.W. and South points are low; they lie N. 14° W. and S. 14° E., *true*, and are five or six miles asunder. Between them the land hollows back, so as to form somewhat of a bay, which, if it affords good anchorage, as it is said to do, would shelter a ship from all winds between North and E.S.E. We did not observe any beach at the head of the bay; perhaps from having passed at too great a distance.

"Some distant land opened from the south point of St. Antonio, at S. 75° E., *true*, which I took to be a part of the island of St. Lucia.

"During the three days before making St. Antonio, the wind varied from the regular N.E. trade to E.N.E., and as far as S.E. by E.; and, at about the time of making the land, it dwindled to a calm. For three days afterward it was light and variable, between North and S.E.; after which it sometimes blew from the N.W. and S.W., and sometimes from the eastward. These variable winds, with every kind of weather, but most frequently with rain, continued until the 23d, in latitude 11° N. and longitude 23° W., when a steady breeze set in from the south-westward, and the weather became more settled and pleasant. The clouds were sufficiently dense to keep off the intense heat of the vertical sun, but did not often prevent us from obtaining daily observations for the latitude and longitude. At the same time with the S.W. wind came a swell from the southward, which made the ship plunge, and opened her leaks considerably.

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* This circumstance is also noticed by M. Frézier, in his voyage to the South Seas.

"The south-western winds continued to blow without intermission, and drove us, much against my inclination, far to the eastward toward the coast of Africa. One or two attempts were made to go upon the western tack, but this could not be done with any advantage until the 2d of September, when we were in latitude 3° 50′ N., and longitude 11° 15′ W. The wind had veered gradually round, from S.W. to South, as we approached the African coast, to the direction of which it kept at nearly a right angle. I had not fully adverted to the probability that the winds blowing upon this coast would prevail to a greater extent at this season, than at any other time of the year; otherwise, as I wished to avoid Africa, I should have passed some degrees to the westward of the Cape Verde Islands, and probably have carried the N.E. trade to the 12th, or perhaps to the 10th, degree of North latitude; and in 8°, or at farthest in 6°, the S.E. trade might have been expected."

Admiral Krusenstern's Remarks on crossing the Line, and passing through the Equatorial Current, have been given in the *Atlantic Memoir*, 7th Edit. pages 196, 7, 8, 9. On the 9th of *February*, 1804, the *Nadeshda* had arrived in 34° 38′ S., and 47° 30′ W. With winds previously veering from E.S.E. to N.N.E., the course was southerly. It blew very fresh, with gusts of wind and rain, and then again fair weather.

The ship advanced toward the South until she attained the latitude above-mentioned. At two *a.m.* the lieutenant who kept the middle watch observed a curious ripple of the water occasioned by a current. It formed a line stretching N.N.E. and S.S.W., as far as the eye could reach, and was, throughout, lighted up so strong, that, according to his description, it had the appearance of a fiery furrow. This was the true limit of the current, which, since our departure from St. Catharine's had carried us fifteen miles a day to the S.W.

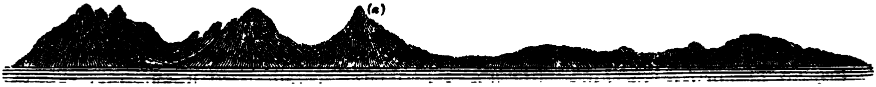
On the 10th of February, at noon, it was found that the current had set N.N.E. 17 miles in the vicinity of the River Plata, the mouth of which was passed at the distance of 240 miles; and by the time the ship had completely passed the mouth of this river, the current set 32 miles in the same direction as the preceding day, N. 28½° E. The weather was now most favourable, and the wind generally fair. In the parallel of 37° the first albatross was seen, and several storm-birds. In that of 40° were seen several large beds of sea-weed, which are generally supposed to denote the vicinity of land, but from which the ship was 600 miles distant.

SECTION II.

PARTICULAR DESCRIPTIONS of, and SAILING DIRECTIONS for, the ISLANDS of PORTO-SANTO, MADEIRA, the CANARIES or CANARY ISLANDS, the SARGASSO SEA, the CAPE VERDE ISLANDS, FERNANDO NORONHA, &c.

I. The ISLANDS of PORTO SANTO and MADEIRA.

PORTO SANTO, &c.—Ships from the ports of Europe, when bound to Madeira, are recommended to make, in the first instance, the Isle of Porto Santo, and thence proceed for the Road of Funchal, on the track shown upon the particular plan given in the large Chart of the Atlantic. The land of Porto Santo is very remarkable, and may be seen, in fine weather, 15 or 20 leagues off. It first appears in two or three very high hummocks, by which it is distinguished from Madeira, and the little isles named the *Desertas*. On the S.W. side is a small town and good road, where water and refreshments may be had. This road is described as, in some respects, better than that of Funchal. The position of the village on the South side is given as lat. 33° 3′, long. 16° 18½′.



Porto Santo (a) bearing South, 14 miles, as taken by Captain J. W. Monteath.

Of Porto Santo, the highest hills, which are perfectly barren, stand at the two extremities of the island, being divided by a central valley or plain.[*] The whole has a parched burnt-up aspect, especially after harvest: yet a considerable quantity of corn is grown on the level land, and near the town, on the S.W., a narrow band of vines stretches along the shore; the plants are not trained, but drawn on the hot sand, and the fruits thus ripen earlier than at Madeira. The island has but one fountain of good water; it is on the north side, and conducted to the town by a *levada*. The other springs are all brackish.

With the exception of a few pines and palms, Porto Santo is destitute of wood. There is not even brush-wood. For fuel, therefore, the inhabitants depend on Madeira. The town is insignificant, and the island is occasionally used as a place of exile from the same place. The population is supported chiefly by the fishery, and is estimated at about 1200 persons.

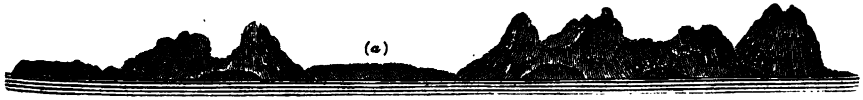
Large boats trade between Porto Santo and Madeira. Between the two isles the prevailing wind is generally from the N.E.

To the northward of Porto Santo there is a ledge of rocks, the position of which was ascertained by the officers of his Majesty's sloop, Falcon, Lieut. J. Bowen, in January, 1802. The least depth upon them, according to the observations then taken, is 4½ fathoms. They are steep-to, and lie at the distance of 8 miles from the northernmost point of the island, with the N.E. point of Porto Santo bearing S.S.E.; the Ilheo da Fonte, or northernmost rock, S. by W., and the west point of the island S.S.W.

The bank extends east and west, *true*, nearly a mile and a half, terminating in a reef to the westward. The shoalest part, supposed to be a pinnacle rock, lies as above, or *nearly so*, the boat in which the bearings were taken being agitated by the sea.

There can be little doubt that this is the reef, formerly said to lie 3 leagues to the N.E. of Porto Santo, on which a Dutch ship was lost.

A bank of rocks, on which the least depth is 40 fathoms, lies about three miles to the E.S.E. of the Ilheo de Serra, the south-eastern islet of Porto Santo.



Porto Santo (a) N. by E. 12 miles; taken by Captain Monteath.

DESERTAS.—The little isles, called the Desertas, on which there are a few fishermen's huts, are barren fragments of rock and earth, represented as lying nearly in a North and South [*N.N.W.* and *S.S.E.*] direction.

There are three of them, all very difficult of access, both from the heaviness of the surf on the beach, and the steepness of the cliffs. The interior surface of the Great or Central Deserta forms a hollow or valley, and is composed of loose rock, destitute of vegetation. Sea-fowl abound; and a guard of three soldiers, to prevent smuggling, is kept here.

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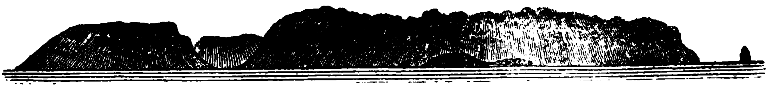
[*] The highest hill rises to about 1600 feet above the sea. Bearing S.W. by W., 12 leagues, Porto Santo appears like two islands, detached and at a distance from each other.

The Table or Northern Deserta (*Ilha Chao*) is comparatively low and flat. It is generally covered with marine grass, and is farmed for the sake of the *lichen roccella*, or orchilla weed, which it produces. Here is, also, great plenty of shell-fish,—limpets and *cracas*, which are collected for the Funchal market. Rabbits, too, abound; and the stormy Petrels, or Mother Cary's Chicken, hide in the rabbit burrows.

At the distance of 10 leagues, and bearing W. by N., the Desertas appear separately; the middle one long, high, and nearly even; the southernmost, called the *Bujio*, in two hummocks, nearly as high, and about two-thirds of the length of the former. At the distance of 6 or 7 leagues, the northern islet becomes discernible, like a low wall: close to this is a high rock, the *Pyramid*, frequently mistaken for a ship under sail. Several outward-bound West-India ships were dashed to pieces, a few years since, by running on the Desertas in the night; the consequence of an error in dead-reckoning.

Between the Desertas and Madeira is a clear passage, eight miles broad, having no soundings, except at 50 or 60 fathoms, almost close over on the Madeira side. In the season of the breezes, (the N.E. winds, which prevail in summer;) a strong current sets through this passage to the south-westward.

The passage between the larger Desertas is clear, though bounded on each side by breakers, or rather by a surf; but it should not be attempted, unless from necessity, as it is very narrow, and has no soundings, or at least very deep water, in it; and a ship is subject to be becalmed in it by the northern Deserta, which overlaps the Bujio. This happened to a vessel of about 200 tons, which came through it in the night, having mistaken it for the broad passage to the northward.



The Southern Deserta S.W. by W. 6 miles; taken by Captain Monteath.

MADEIRA.—"Madeira may be shortly described as one mass of mountain, rising to the highest summits in the centre, descending on the north to a range of lofty cliffs, bounded by the ocean, and to a lower and gentler character of coast on the south. The island is riven throughout with deep ravines and valleys, which radiate to the sea in all directions." The cultivation is confined to the coast, or to the bottoms of some of the valleys, and occupies altogether a very small proportion of the surface. Vines form the chief feature; for the corn grown annually scarcely supplies a two months' consumption to the inhabitants.

The whole coast of the island presents a range of cliffs or headlands, varying in altitude from 200 feet to nearly 2000; for the most part of a dark volcanic aspect.

In the island may be found almost every European and tropical luxury. The myrtle, the geranium, the rose, and the violet, may be seen on every side. The geranium, in particular, is so common, that the honey of the bees is strongly impregnated with its odour.

Nearly all the productions of the tropics are cultivated here with success; and the guavas, citrons, bananas, and custard-apples, are even considered as superior to those of the West-Indies. The vegetables are the same as those of England, and generally of much the same quality. The same garden which supplies the dessert gives likewise the coffee which closes it, and of the finest kind.

The population of the island, in 1826, was estimated at 102,000.

At Madeira is a wind called the *Leste*, which, as its name implies, comes from the East, although all East winds are by no means *Lestes*. It appears to be of the same kind as the *Harmattan* of Western Africa, and is of a hot, close, drying, nature, particularly oppressive to some constitutions, whom it affects by languor, head-ache, and a parching of the skin and lips. What is remarkable, the residents are those whom it most disorders in this way. Visitors, in general, suffer much less; and the invalids are never so well as while it lasts. A peculiar clearness and cloudlessness in the atmosphere are among the invariable indications of Leste, and the weather during its continuance is most delightful; the sky of a deep blue, so stainless that one might fancy it had never been sullied by a cloud; with a transparency in the atmosphere which, like the effect of moisture, seems to bring out fresh hues from every object.

At times, but not frequently, the Leste is accompanied by a strong wind, but the weather is still delightfully warm and pleasant. The nights, too, are delicious; soft and balmy; and with the moon walking in summer brightness, and the orange trees in flower, the air is loaded with perfume. With the departure of the Leste rain almost invariably follows.

The climate, generally, is delicious, and strikes with peculiar charm to a stranger, whom a short sail has transferred to it from the very midst of the gloom and chill of an English December. Indeed the great natural distinction of Madeira is the climate, which, perhaps, taken altogether, is the finest in the world. The bitterly cold winds which, during some seasons, prevail on all the shores of the Mediterranean, are never felt at Madeira. Of winter there is, properly, none; a peculiarity not so remarkable as the fact of the comparative mitigation of the summer heat; which, except in particular situations, hardly exceeds that of an ordinary hot season in England. The perfection of the climate consists in this uniformity of its temperature. It differs, perhaps, less in summer and in winter than in any other spot north of the tropic. The thermometer commonly ranges from 60 to 75; and, in the greatest extremes, seldom sinks or rises more than five degrees below or above that medium.*

Although thus in the enjoyment of an almost continual spring, the island is singularly free from the annoyances and inconveniences that so commonly infest warm climates; and which go far, in fact, to overbalance all the luxury derivable from the temperature itself. Here are no periodical fevers; and, what is more remarkable, no snakes nor noxious reptiles of any kind; nor scarcely even a gnat.

Water, of excellent quality, is abundant. Springs are found every where, and copious; even the streams at the bottom of the ravines, fed by the mountain-mists, are never dry in the hottest season; and the height from which they descend enables the inhabitants to divert the course of the water at any elevation or in any direction; the whole cultivated region, therefore, is irrigated on all sides by these *levadas*, or water-courses. On the coast fish is abundant, and forms an important article in the food of all classes.

The only corn grown is bearded wheat and barley, and of this not more than is equal to two months' consumption in the year. That mostly imported is from the ports of the Baltic. *Milho*, or maize, is the principal food of the lower orders, and is imported chiefly from the Mediterranean. Timber and pipe-staves are from America.

The towns and villages are invariably situated on the sea-coast, and commonly at the outlet of a ravine; but where the bottom is fertile, and the surface permits, the cabins and *quintas*, or country seats, are often scattered up a considerable extent of the valley.

The capital of the island is FUNCHAL, on the S.E. coast. This place is not handsome, and strangers commonly consider it as ugly and inconvenient. It is true that the streets are generally both steep and narrow; the former is rather the fault of the island, the whole coast of which is described as scarcely presenting an acre of plain surface; and as for their narrowness, it must be recollected that they are not like those of any other place, intended for the passage of wheel-carriages; such a machine being unknown here; but for foot-passengers or horsemen, the streets of Funchal are wide enough, especially under so sunny a sky, and they are now generally clean. Their very steepness contributes to this quality, asisted by a copious little runnel of water, which is generally seen coursing down the middle to the sea; and the sound and sight of which are particularly grateful.

The houses are commonly low, not often exceeding one story in height, and have generally an agreeable look of whiteness and neatness in the exterior. Those belonging to the *fildagos*, or to the richer merchants, are large and handsome. There is no public edifice of any consequence. The governor resides in the castle, a large, irregular, half-modernized mass of gothic building, situated near the beach. All the houses have at the top a kind of

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* The mean temperature, from observations during eighteen years, has been given as follows;—January, 64° .18; Feb., 64° .3; March, 65° .8; April, 65° .5; May, 65° .53; June, 69° .74; July, 73° .45; Aug. 75° .2; Sept. 75° .76; Oct. 72° .5; Nov. 69° .8; Dec. 65°. The year is, therefore, one summer, with comparatively little alteration either of temperature or hue.

gazabo or belvedere, of more or less elevation above the rest of the building, which they call *torrinhas*, or turrets, and as the city is built on a rapid ascent, from the shore, these lanterns always command a view of the harbour. The great object of resort to these turrets is to look out for vessels; the first thing to be done in the morning being to mount the turret, to see if any vessel had arrived in the offing in the course of the night. It is curious, says the writer, what a degree of accuracy in the distinguishing of ships at a distance, is acquired by this habit of watching them. Every merchant's house has private signals, which are hoisted by the vessels respectively consigned to them; the destination, and even the name of which is thus commonly known before they reach the bay.

A late voyager says that, on advancing slowly into the Bay of Funchal, early in the morning of the 1st of January, 1825, the town, the country houses, and *Nossa Senhora do Monte*, glistered like silver through the thin mist which floated on the bosom of the mountains. The bells of many churches soon began to hail the new year with that blessed sound which mariners, above all others, love to hear.

The town of Funchal stretches along the margin of the bay for nearly a mile. It is, by no means, so dirty as formerly. The cathedral is a fine building: before its western door is a *parvis*, or open space, and beyond that the *Terreiro da Se*, a very pleasant promenade, under four or five parallel rows of trees, and enclosed by a wall, a few feet in height. Some pretty houses are situated in the street on either hand, from the balconies of which the ladies look at the gentlemen below. Beyond the Terreiro is the market-place, which is very clean, and regularly laid out in streets and stalls: the latter roofed.

The church of *Nossa Senhora do Monte* is the neatest in the island. It is seated on a terrace just half way up the mountain, and commands one of the most enchanting views in the world. The *quintas*, or country residences, of the English merchants are delightful, and it is pleasant to spend a Maderian afternoon in riding about, with good company, from one to another. The English church, on the skirt of the town, is an elegant and convenient building, literally embosomed in ever-springing roses and white daturas.

The *Corral* or *Curral* of Madeira, a few miles north-westward from Funchal, is one of the grandest scenes in the world. It is finely described in the volume entitled, "*Six Months in the West Indies, in* 1825." A friend, who had visited Swisserland said that, in the Alpine country he had never seen any thing so wonderfully sublime as this place. It is a huge valley, or rather crater, of immense depth, inclosed on all sides by a range of magnificent mountain precipices, the sides and summit of which are broken into every variety of buttress or pinnacle,—now black, and craggy, and beetling,—at other parts spread with the richest green turf, and scattered with a profusion of the evergreen forest-trees, indigenous to the island; while far below smiles a fair region of cultivation and fruitfulness, with a church and village, the white cabins of which seem half smothered in the luxuriance of their own vines and orchards.*

POSITIONS.—Point S. Lourenzo, the East point of the island, lies in latitude 32° 44′ N., longitude 16° 38′ W.; the town of Funchal lat. 32° 38′, long. (well determined) 16° 54½′; the west point of the island, Punta del Pargo, lat. 32° 49′ long. 17° 16′. Variation of the compass, 21° West.

The BAY of FUNCHAL, is formed on the west by the *Pico* and *Punta da Cruz*; on the east by *Cape Garajao*, or the *Brazen Head*. The last is, by no means, the loftiest of the neighbouring cliffs; but as, by its projection, it forms the eastern horn of the bay, it becomes an object of constant attraction to all vessels from Europe having to round its point.

Punta S. Lourenzo is the easternmost part of Madeira. This point is a long narrow ledge of rock, about 6 miles in length, but in no part one in breadth. Its surface is exceedingly varied, but its general tendency is that of declivity from the cliffs and peaks on the north side, to a low rocky shore on the south. The cliffs and peaks, though lofty, are not nearly of so great elevation as those of the island in general, but are of a much more broken and fantastic character. Here and there a patch of herbage only affords scanty pasture to a few sheep or goats.

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* Capt. W. F. Owen says that the *Curral* means simply a sheepfold, and is an immense valley, completely surrounded by hills, whose sides are literally perpendicular, in no part being less than 1000 feet high. Round a part of these cliffs is a narrow road, leading to the garden-houses and country plantations, cut out of the rock, about 10 or 12 feet wide. On riding along the road over the Curral, it seems like an unfathomable abyss, filled only by clouds and vapours, rolling in a constant motion over each other.—Voyage, Vol. I., p. 11.

Captain Owen adds, that "Funchal is, from its situation on the side of a hill, very clean, and has various marks of opulence and industry. The peasants are an athletic and free race, very laborious and frugal. Here the meanest subject can acquire and enjoy property; ends never attainable where the wretched system of slavery is established."

Camera de Lobos, a diminutive old town, stands at nearly 5 miles to the westward of Funchal. Here a ledge of black basaltic rocks projects and forms a kind of shelter for its little harbour. This place is interesting as the spot where the Portuguese discoverers first made their landing in 1420. It itself it is poor enough, but the sides of the mountains around are covered with *quintas* and vineyards, and are said to form one of the finest wine districts in the island. To the west of the town the cliffs begin to rise rapidly, till at no great distance, they accumulate into *Cape Giram*, a magnificent headland, the loftiest of the island, being not less than 1600 feet above the level of the sea, which washes its base.

Beyond Cape Giram may be seen the perpendicular and majestic cliff called the *Ponta da Sol.* Near this, to the eastward, is the outlet of *Ribeiro Bravo*, and over it the chesnut-shaded village of *Campanario*. The Ponta da Sol, in a westerly gale and stormy weather, appears surrounded by the colours of the rainbow; hence, probably, its name has been derived. This cape is about 3½ leagues to the westward of Funchal.

On the north coast of Madeira, the *Penha d'Aguia*, or *Eagle's Rock*, is a vast insulated and somewhat cube-shaped mass or mountain of rock, which rises immediately from the sea, and stands out black and huge against it. Its height is estimated at not much less than 1000 feet. The summit is an extensive surface, cultivated, and shelving toward the sea.

The pretty little town of *Ponta Delgada* is the most considerable town on the north coast, and one of the liveliest and neatest in the island. It is built on a low and richly cultivated point of land, jutting out from the base of the mountain. The houses, which are numerous, and many of them large and respectable, are scattered thickly among the vines and orchards, and with very pleasing effect. The church, large and handsome, is close to the sea.

Although Madeira is so elevated, excepting the eastern end, which is a low rugged point, yet it is often so entirely clouded over as not to be visible at the distance of 5 leagues. But, when abreast of Porto Santo, the island commonly appears as one great mountain, with its summit hidden in the clouds. Shortly after appear the Desertas. Having passed those islands, you will soon perceive the ships in the Road of Funchal; and, from their riding, it will be seen how the wind is in the road, as it is common to have a strong breeze from the N.E. or East, on passing the Desertas, when, at the same time, the wind, in the road, is from the S.W. or W.S.W.

When sailing in toward Funchal Road, a large rock, named the Loo Rock, with a fort on it, will be seen on the West side of the road, a little to the westward of the town. With this rock, N. by E., when in 38 or 36 fathoms, let go the larboard-anchor, with two cables on it; for, should there be a fresh breeze from the eastward, it will be scarcely possible to bring up until the splice is veered a good way out. It is requisite to ride in the road with a whole cable, and with a splice so situated that you may be able to cut near it, should circumstances unfortunately compel you to put to sea without weighing anchor. While riding, keep a slip-buoy on the cable, have a kedge-anchor and a nine-inch hawser to the westward, to keep the ship steady, with the hawser on the starboard bow, as the wind generally veers from the eastward to S.W. and West. When the land-wind makes a cross, the end of the hawser may be shifted.

The general anchorage is in from 30 to 35 fathoms, with the citadel (called the *Peak Castle*, a brown square fort on a hill over the N.W. part of the town) a little open to the eastward of the Loo Rock; the latter at the distance of half a mile.

With the Loo Rock and citadel in one, bearing nearly N.N.E. ¼ E. and Funchal Steeple N.E. ¼ N., the anchorage appears equally good, in 35 fathoms stiff ground. With the same marks, with the Loo about a mile off, there is good ground in 45 fathoms. To the westward, the ground changes to sand and rock, and to the eastward it has a sudden declivity from 50 to 55 fathoms, stiff clay ground, to 100 fathoms, rock, and then no ground.

In case of a S.W. gale, which may be frequently expected in winter, the situation with the Loo and citadel in one, or the citadel just open to the westward of the Loo, will be found most convenient. On the contrary, the citadel well open to the eastward of the Loo, is the best situation when a south-easter may be expected.

When coming into the road, with a brisk wind, sail should be reduced and secured in time, to prevent having too much way through the water, at the moment of anchoring; and ships should be brought up with their heads to seaward; for thus, in case of any accident in bringing up, sails may be had off shore, or otherwise, as required.

Mr. Finlaison, who wrote his remarks in 1821, has said, " It is generally reckoned the best anchorage for ships with the Brazen Head E. by S., Point de Cruz W. by N., Loo Castle N.E.: but I would recommend ships to anchor at a good quarter of a mile to the westward of these bearings; as I am convinced that here is better holding ground, and clear of anchors. Ships should not anchor farther to the eastward than to bring the high fort [Peak Castle] on the *west* end of Loo Castle. With the fort open to the eastward of Loo Castle the ground is rocky, and has in it many anchors.

" *Those riding in Funchal Roads* should be very active when they observe a swell coming in from the S.W.; at this moment no time is to be lost in getting under-way, for the swell indicates that a gale is certainly coming on; particularly so in the months of December and January, generally the commencement of the rainy season. Should it come on to blow very hard from the westward, the best mode is to run to leeward of the Desertas, where shelter from the wind may be found, and water perfectly smooth: thus you avoid the risk of losing sails, by heaving to windward." *

Off the valley of Funchal, there are regular land and sea-breezes, particularly during the summer; the sea-breeze sets in from the south-westward some time in the forenoon: the land-breeze sets off shore about ten o'clock at night, sometimes later, even to two or three o'clock in the morning: these breezes do not extend above 3 or 4 miles off shore: but, when it blows fresh in the offing, there is generally a counter-breeze in the stream of the Valley of Funchal; unless it blows hard, when the true wind prevails also in the road.

There is generally a surf on the beach, early in the year particularly, which prevents landing in a ship's boat any where, except within (to the north-westward of) the Loo Rock, about half a mile from the town; therefore, the boats of that place are employed for goods, watering, &c. The tides rise and fall about 7½ feet; and the current along the south side of the island seems to be always governed by the true wind in the offing. The rainy season is in January, February, and March; October is also frequently a wet month, as well as November and December.

The road is open from the West to the S.S.E. The winds blow strongest here when from S.W. to S.E. Ships anchoring in the road in winter must be guarded against the consequence of a dark gloomy appearance of the atmosphere to the southward, with a swell setting in; for it is very dangerous to remain at anchor with these prognostics.

Squalls sometimes come fresh off the land; there is one instance of a hurricane down the Valley of Funchal blowing every ship out of the road, which was so violent, that the ships were hid from the town by the spray of the sea, although in a clear sun-shining day.

The best way for ships, however large or numerous, when bound into Funchal Road from the eastward, with the wind north-easterly, is through the passage between the Desertas and Madeira. The North-easter will carry them to the offing of the Brazen Head, the East point of the Bay of Funchal. In the night a single ship may keep over toward that bluff point, and, with her boats towing a-head, when becalmed, luff up into the stream of the land-wind, and by that means fetch the anchorage. Ships must show a light at their ensign-staff in the night, to prevent being fired at from the forts and Loo-castle. In the day, they should keep farther distant from the land than in the night, to avoid being becalmed under it, and to gain the stream of the sea-breeze. If, from over caution, or other reasons, they fall 2 or 3 leagues to the leeward of the road, they should then keep plying up in the stream of the valley, until they gain the vein of the sea-breeze. In working in with a land-breeze, it is best to make short tacks, opposite the valley; as here both the land and sea-breezes are most regular.*

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* Some of the old inhabitants affirm that there is no danger in attempting to ride out a gale from the southward, as it rarely continues long. It is said that no vessels with good ground-tackle have ever been lost by pursuing this method, and that many, in attempting to get away at the commencement of the gale, have been driven on shore.—*Voyage of the Chanticleer, vol. i. p.* 10.

Small vessels, from North-America and the Western Islands, come in, generally, round the west end of the island; but are frequently becalmed a considerable time under the high land there. From this reason, ships, on leaving Funchal should make sail with the land-wind, and stand directly off from the road; ships bound to the southward, by taking a contrary method, having continued several days becalmed under the western part of the island.

In the winter-months, eddy-winds and squalls, proceeding from the high-land, are frequent and severe, and the ships are often forced to put to sea from the road. Several westerly and S.W. gales, with rain, then frequently prevail, and prevent regaining it for some time. At these periods, Madeira and the Desertas are often obscured in fog. The squalls have been found so sudden and violent near the Desertas and about the S.E. end of Madeira, as nearly to overset the ships in the vicinity: and many have been driven by them far to the eastward.

With a gale at S.W., and a high sea rising, off the S.W. end of Madeira, a ship, in November, 1797, bore away to find shelter under the lee of the island; the weather dark with rain. Between Madeira and the Desertas, the ship was suddenly becalmed; then followed an eddy-wind from N.E., and the sea frequently over the bowsprit and jib-boom. A dark cloud was now over head, and the ship near the land of Madeira. At this time two ships were seen 2 or 3 miles to the eastward, in clear sunshine, running before a sharp squall at S.W.

It has been said that, a southerly wind never blows hard quite home to Funchal, that the south-westers and south-easters are never expected unless in January, February, and the beginning of March; and that large ships almost always ride them out; but Captain Horsburgh has stated, that "these southerly gales sometimes blow quite home to Funchal, even in November and December: and, when they are apprehended, it is common for ships of every description to put to sea. These S.W. or S.E. gales are, in general, preceded by a swell in the road, often accompanied by gloomy weather, drizzling rain, and a very unsettled breeze from the land, veering backward and forward very suddenly. Under such indications, ships generally proceed to sea:" for, should it blow strong from the southward, it would be almost impossible to clear the shore; the anchorage being so close to the land. A few years ago several vessels were driven from the anchorage, and completely wrecked on shore.

The regulations of the port of Funchal require all ships before or immediately on anchoring, to acquaint the governor of the island what they are, and their reasons for stopping there. Ships of war are not to send their boats to vessels coming into the road, until they are visited by the pratique-boat, a boat manned by persons appointed to enquire if any infectious disorder is on board. The same is to be observed respecting vessels that are departing, which are not to be boarded after the visiting officer has been to search for natives attempting to leave the island clandestinely, and for prohibited goods. English ships of war salute with thirteen guns, after an assurance of an equal return.

The boats may land on the beach in summer: but they are driven by a violent surge on

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* Admiral Mackellar says, in his Journal, "Of Funchal Roads, I shall only observe, that, in running for the island, it is necessary to give the North end sufficient room; so as by nearing the land too much, you may not be becalmed, and thereby drift to leeward of the Roads, observing to open out the anchorage well before you haul in; and, if possible, drop anchor to the southward of the Loo Rock, in about 30 or 35 fathoms, nearly off the centre of the town; but frigates and smaller vessels may go close in shore, and anchor in 20 or 25 fathoms: my reason for choosing this anchorage is, that there is a truer land-wind to get under weigh with, and a better drift, should you bring your anchor home; which, from the steepness of the bank, and the badness of the ground, often happens.

"The usual place of landing is the steps of the Loo Rock; and, though landing here is attended with some difficulty when the sea-breeze sets in, it may generally be effected without much danger: in moderate weather the beach may be landed on, but I strongly recommend landing in the island boats. Refreshments of all kinds may be had, the prices depending much on the seasons, and the number of vessels in the Roads. In leaving Madeira, you should do it during the night, or early in the morning, as then the land-wind blows right off, and you drift to sea, without risk, giving you time thereby to stow your anchors, and clear the land before the sea-breeze sets in."

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the shore, which is shingly. The landing near the Loo Rock, before mentioned, is safe and easy, being defended from the surge.

It is necessary to be cautious of the shore-boats, which will come to the ship to sell fish, fruits, and vegetables, as their chief object is often the sale of the worst spirituous liquors to the seamen, and sometimes concealed goods. Fresh beef, water, and vegetables, are to be procured here for the ship's company, and are sent on board in boats belonging to the place.*

There

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* Masters of vessels at Madeira will do well to agree with one of the boatmen to attend the vessel when required, during her stay, leaving the remuneration to be fixed by the consignee; they will thus avoid impositions and be served much cheaper than if they only hire a boat even now and then for a trip.

Be aware of a set of pretty-well dressed fellows, who may come off and offer a good price for any articles you may have to sell; for, if once you land the articles, you will get no cash in payment, but wine only, that generally bad, and at a high price: whereas, with the respectable merchants you may sell at a nominally high profit, if you take payment in good wine.—*A. L.*

The PORT REGULATIONS are as follow:—On anchoring at *Funchal Roads*, no vessel can have communication with the shore, or the shipping in port, until visited by a flag-boat from the government, or from the health office. But in case of distress, when a vessel does not intend to anchor, and wants to have communication with the shore, her boat, by proceeding to the *Loo Castle*, will avoid being fired at; and after examination, leave is generally given for the officer in her to go into town, and return to the ship without any embarrassment.

The master, purser, or other persons coming in the first boat from any vessel regularly visited, must land at the health office, there to undergo the customary examination; and the captain or purser should proceed immediately to the Consul's office, to report the ship: passengers are free from restraint after passing the health office.

Captains or pursers so landing, must bring with them the vessel's Register and Mediterranean Pass, and also the manifest of her cargo, as without these documents business cannot be transacted at the Consular and other offices.

No vessel lying in port, can have any communication with one that is coming in, or that has already anchored, until such new comer shall have been regularly visited.

No vessel at anchor can change her berth without licence from the government.

All boats that pass between the shipping and the shore, after sun-set, are subject to pay a pistareen and a half, for a government licence.

No seaman or soldier to leave their ships without permission in writing from the captain or commanding officer.

Any seaman or soldier found on shore after sun-set, without written leave of absence, is liable to be taken up by the government, and kept in custody until claimed and sent on board ship: which will, exclusive of his maintenance, occasion an expence of 2 dollars for each individual, to be deducted out of his wages: and even with leave, as above, any disorderly conduct is immediately taken notice of by the government, and punished accordingly.

All captains or commanding officers are requested to read the above two articles to the sailors and soldiers on board their ships, as particularly relating to them.

Captains or pursers must give notice at the consul's office, 24 hours, at least, before the time of their intended departure.

No vessel is to carry from Madeira any person or persons, excepting those that came in her, *without a regular passport;* as in case of detection in attempting to do so, the Master is liable to a fine of 100 dollars, and to 3 months' imprisonment.

In cases where the captain of a vessel shall be judicially notified not to carry away any particular person from the island, and he does receive him on board, notwithstanding such judicial warnings, he becomes liable for all the debts which such person owes.

When vessels are ready to depart, the captains must, through the consul, or their consignees, apply to the government to have its visit sent on board at the hour when they will be ready to proceed to sea.

After a vessel has been visited for the purpose of proceeding on her voyage, and circumstances require her to have communication with the shore, or the shipping in port, she cannot sail until visited a second time.

No vessel can sail after sun-set, without special licence; and in case a ship is visited for departure, and finds she is obliged to remain a night after, she must not attempt to sail till visited a second time.

As vessels are frequently fired at from *Loo Castle* for attempting to anchor at night, it is recommended to those who make the port too late in the evening, to have their colours seen, to stand off and on till daylight, when the restriction ceases; indeed, at all times it is as well to hoist the colours and merchant's signal as early as possible, for the information of the consignees on shore.

Any vessel attempting to get under way before she is visited, will be fired at from the forts, and will be obliged to pay very dearly for the powder and shot. This must also be understood in not observing any of the foregoing rules.

No commander of a vessel can leave any of his crew behind him, excepting in the hospital, without first giving security in he consul's office for their subsistence.

As

There are two other anchoring-places on the south side of the island; one is off Santa Cruz, which is exposed to the N.E. winds; the other is to the westward, where ships are commonly sent to perform quarantine. The latter is a small bay to the eastward of *Ponta da Sol*, mentioned in page 23. The beach of the Quarantine-Road, as also that of Funchal, is of blue stones and black sand.

ABSTRACT, on SAILING to and from FUNCHAL, in H.M. Ship INVESTIGATOR: by Captain MATTHEW FLINDERS, 1801.

Aug. 1, At noon, Porto Santo bore N. 11° W. *true*, and the rocky Islands called the Desertas from *N.* 65° to *S.* 85° *W.* (*true*) distant 5 leagues.* The south end of these islands lies, by our observations in latitude 32° 24′ 20″ N., which differs less than one mile from its position in Mr. Johnston's chart of the Madeiras.

There being little wind next morning, I went off, in one of the cutters, to the southernmost island, called *Bujio*, which was not far distant. The distance, however, proved to be more considerable than was expected; and there being a current setting southward, we did not reach the shore until near three in the afternoon, when it was necessary to think of returning.

A small ledge of rocks, which projected a little from under the cliffs at the S.W. part of the Bujio, afforded a landing-place; but it was impossible to ascend to the top of the island. We saw no other animated beings than a few birds, something like green linnets, but which were said, at Madeira, to have been canary-birds; and the other productions were scarcely sufficient to afford amusement, even to a naturalist. The cliffs over-head showed marks of irregular stratification, and in some of the lines there was a red tinge, apparently of iron. The base underneath was black and honey-combed, as if it had been in the fire, resembling, in this respect, the common stone at Funchal.

We left the Bujio well satisfied that, so far as we could judge of the islands, the name Desertas, or Desert-Islands, was well-chosen; and, soon after dusk reached the ship. There was then a good breeze from the North-eastward, with which we steered for Madeira, tacking occasionally during the night, to take advantage of the different flaws of wind. At the following noon the ship was under Brazen-Head, which forms the east side of Funchal Road; and being there becalmed,† we towed in with the boats, and came to an anchor at four o'clock, in 22 fathoms, steadying with a kedge to the N.W. In this situation, which seems to be as good as any in the road, the bearings (by compass) were as follow:—Brazen-Head, S. 71° E.; Punta de Cruz, on the western side, N. 85° W.; and Loo-Fort, distant one-third of a mile, N. 12° W.

The north-east winds usually prevail at Madeira in the summer-season, and sometimes blow very strong. To reach Funchal Road, ships are accustomed to sail, between the East end of the Madeira and the Desertas, before the wind. They are not very desirous of passing close to Brazen-Head, where they would be becalmed, but keep off a mile or two, in the skirt of the north-east wind, until they are off the town, or even off Punta de Cruz, where they generally find a breeze from the S.W., which takes them to the anchorage.

As the greatest attention is necessary on the part of the masters of vessels for the benefit of the concerned, it will be found much to the interest of all parties, that they by no means sleep on shore; a caution of this kind is doubly necessary in the winter.

It is necessary that captains and supercargoes should be acquainted, that in case of breakage in the measurement of corn, after allowing 2½ per cent., the vessel must make up the deficiency at the market price in Madeira, according to the long-established regulation of the British factory.

The *Loo Castle* usually fires two guns without shot, on any vessel's breaking the Rules of the Port: if those are attended to, in general they take no more notice; if not, not only the *Loo*, but the other forts, fire with ball, till their object is obtained.

As many inconveniences arise from not observing the foregoing regulations, every commander of a vessel will find it to his interest to attend to them, as otherwise he will forfeit the protection of his consul, and find the consequences in the highest degree disagreeable.

To avoid considerable delay and expence, it is absolutely necessary to have a bill of health, endorsed by the Portuguese consul, or vice consul, of the last port of clearance.

* Captain Flinders says *three* leagues, but this appears to be incorrect.

† A common occurrence when entering this way, as shown in page 25.—ED.

This S.W. wind is the sea-breeze of Funchal; and, during the time we lay in the road, it usually set in at eight or nine o'clock in the morning, and prevailed as far as three or four miles in the offing till sunset. A variable breeze comes off the land in the night, at which time it is recommended to ships to pass close to Brazen-Head, and tow into the road.

"On the 6th, in the evening, the scientific gentlemen returned from an expedition toward the *Pico Ruivo*, which is the highest of a ridge of mountains occupying the central parts of the island, and is said to be 5067 feet, or nearly an English mile, above the level of the sea. The ascent was found to be very difficult; and this, with the heat of the weather, and limitation of their time to this evening, disabled them from reaching the summit. It was late when they arrived at the shore; and, in embarking, abreast of the town, they had the misfortune to be swamped, and to lose the greater part of their collections and sketches, although the boat was managed by Portuguese watermen, accustomed to the place.

"The best landing is behind the Loo Rock; but the stony beach, in front of the town, is usually safe in the summer-time. It was so on our first arrival, until the strong eastern winds, in the offing, raised so much swell as to make it dangerous, even for people experienced in the management of a boat in the surf.

"The town of Funchal is placed at the foot of a mountain, which projects from the great central ridge; and the houses, being mostly white, they form a strong, but agreeable contrast with the back land. At different elevations, up the side of the mountain, are scattered the country-houses of the richer inhabitants, placed among groups of trees, and surrounded with vines. These, with a convent dedicated to *Our Lady of the Mountain*, which, like the houses, is white, but partly hidden by foliage, give the whole a picturesque and pleasing appearance from the ships in the road. The town is larger, and there was more trade and activity in it than I was prepared to expect in a small colony, where the students of the college, and ecclesiastics of different orders, form no inconsiderable part of the superior class of inhabitants. Several British merchants reside at Madeira; their houses of business are at Funchal, but their favourite residences are upon the side of the mountain.

"Wine, water, and fresh beef, were the supplies procured at Madeira. Fruit and onions were in abundance, and, probably, were not of less advantage to the health of the people than the more expensive articles.

"On quitting Funchal Road, (August 7,) we were taken aback, at two o'clock, by the E.N.E. wind, about two miles off Brazen Head. It blew so strong as to make it necessary to clue down all the sails; and, until next morning, nothing but close-reefed topsails could be carried with safety. At noon, the log gave 162 miles from Funchal; but the cloudy weather did not admit of taking observations."

2.—THE CANARIES, OR CANARY ISLANDS.

THIS group of islands, supposed to be known to the antients under the name of the FORTUNATE ISLANDS, were neglected by the moderns until the year 1402, when Jean de Bèthencourt, a baron of Normandy, took possession of Fortaventura and Lanzarote, for John, King of Castile. By the treaty of peace between Ferdinand, king of Castile, and Alphonso, king of Portugal, it was agreed that these islands should belong to Spain, in lieu of the settlements on the continent of Africa, ceded to Portugal.

POSITIONS of the ISLANDS.

	Latitude N.			Longitude W.		
Lanzarota or Lancerote; Allegranza I.	29°	25′	30″	13°	30′	30″
Port de Naos	28	58	30	13	32	30
Fortaventura; Isle of Lobos, on the N.E. . . .	28	45	0	13	48	30
Point Handia, the S.W. point . .	28	4	0	14	31	0
Canaria or Grand Canary; the Ileta or N.E. point	28	13	0	15	24	30
Point Arguinequi, the South point	27	45	0	15	38	0
Point Aldea, the West point . .	28	1	20	15	50	30

Tenerife;

		Latitude N.			Longitude W.	
Tenerife; Mole of Santa Cruz	28	28	30	16	15	30
Le Pic or the Peak	28	17	0	16	39	30
L'Orotava, on the N.W. side	28	25	0	16	34	30
Gomera; the port	28	5	40	17	7	30
Palma; Santa Cruz, on the East side	28	43	0	17	45	30
Tassacorta, on the West side	28	38	0	17	57	30
Ferro; town of Valverde	27	47	20	17	56	30
La Dabesa, or Western point	27	44	0	18	9	30

The land of these islands is generally high, being variegated by volcanic mountains, among which that called the Pic, or Peak, of Tenerife, is super-eminent. The inequality of height is, however, so great as to produce differences in the temperature of the different islands. For eight months in the year the summits, excepting those of Lanzarote and Fortaventura, are covered with snow; yet in the valleys, and on the shores, the cold is seldom so great as to render fires necessary. A great proportion of the surface of the islands is covered with lava, calcined stones, and ashes, formerly emitted by volcanoes, the remains of which are still visible in all the islands; and some of them, among which is the Peak of Tenerife, are not yet entirely extinguished. The number of inhabitants is computed at 200,000. The productions, exports and imports, may be found correctly described in most geographic works. The first discoverers found neither corn nor wine; though, at present, there is plenty of both. Variation of the compass, 20½° West.

Vessels may pass between the Canaries, and through their principal channels; as there is no known danger but what may be plainly discerned, excepting a sunken rock, laid down in some charts, in the southern part of the channel, between Tenerife and the Grand Canary, about 8 leagues E.S.E. of the south point of Tenerife, and 4 leagues westward of the centre of Canary.

In sailing from Funchal to Tenerife, keep well to the westward, steering S. by W. ¾ W. [*nearly South,*] in order to avoid the *Salvages*, which are very dangerous in the night.

If prevented from weathering the Salvages or the Piton, (described beneath,) by prevalent westerly and S.W. winds, common in the months of January and February, when a heavy swell may set the ship much to leeward; you may safely bear up and run to leeward of the great Salvage; only observing that, if the swell be very heavy, you must cautiously avoid three shoal spots, lying to the northward and eastward of that isle. Of these, the northern one is about three quarters of a mile to the northward [*N.N.W*] of the isle, the inner one on the N.E., 250 fathoms from it, and the outer, in the same direction, one mile and one-tenth. Two others, with 3 and 3½ fathoms, lie at about half a mile from the eastern shore.

The SALVAGES consist of an island, named *Ilha Grande*, or the *Great Salvage*, a larger islet named the *Great Piton*, and a smaller one, called the *Little Piton*, together with numerous rocks. The *Great Salvage* lies in lat. 30° 8′, and long. 15° 55′. It is of very irregular shape, and has a number of rocks about it within the distance of a mile.

The Great Piton lies at the distance of 8¼ miles W.S.W. ¾ W. [*S.W. by W.*] from Ilha Grande. This isle is 2¾ miles long, N.E. ¾ E. and S.W. ¾ W. [*N.E. by N. and S.W. by S.*] and has a hill or peak near its centre. The *Little Piton* lies at a mile from the western side of the former, and is three-quarters of a mile long, nearly in the same direction; both are comparatively narrow. These isles are seated upon, and surrounded by, one dangerous rocky bank, which extends from the western side of the Little Isle, half a league to the westward.

It has been said of the Great Piton that, in some respects, it resembles the largest Needle Rock at the West end of the Isle of Wight; and, at a great distance, looks like a sail. Its southern part appears green, its northern part barren. It may be seen 5 or 6 leagues off. The Little Piton is very flat, and is connected to the south point of the Greater one by a continued ledge of rocks. The whole of the eastern side of the Great Piton is rocky and dangerous.

The Baron Alexander de Humboldt, in his voyage of 1799, describes his passage from Corunna to Tenerife. The diffuse style of this accomplished writer prevents our giving an exact quotation, but the particulars following are worthy of notice.

Between Corunna and the 36th degree of latitude, no organic body was seen, excepting sea-swallows and a few dolphins; no sea-weeds, nor molluscæ, the oceanic insects which emit the phosphorescent light; but, on the 11th of June, the sea appeared to be covered with *medusæ.** The vessel was nearly becalmed, but the molluscæ were borne toward the S.E. with a rapidity four times that of the current. Their passage lasted nearly three-quarters of an hour. But few were then seen, following the crowd at a distance, as if they were tired with their journey.

Between Madeira and the African coast, light breezes and dead calms prevailed. Here, says M. de Humboldt, we were never wearied of admiring the beauty of the nights; nothing can be compared to the transparency and serenity of an African sky. We were struck with the innumerable quantity of falling stars, which appeared at every instant. The farther progress we made toward the south, the more frequent was this phenomenon, especially near the Canaries. In warm climates, especially under the tropics, the falling stars leave a tail behind them, which remains luminous 12 or 15 seconds; at other times, they seem to burst into sparks, and they are generally lower than those in the north of Europe. We perceive them only in a serene and azure sky: they have perhaps, never been seen below a cloud.

Lanzarote was made on the 16th of June, with exactness, by chronometer. At two, *p.m.*, the land appeared, like a cloud, at the edge of the horizon. At five it was seen distinctly, particularly a conic mountain, which towered majestically over the other summits. The current drew us toward the coast more rapidly than we wished. As we advanced, we at first discovered the island Fortaventura, famous for its camels; and, a short time after, saw the islet Lobos, in the channel which separates Fortaventura from Lanzarote. The moon illumined the volcanic summits of the latter, the flanks of which, covered with ashes, reflected a silver light. *Antares* threw out its resplendent rays near the lunar disk, which was but a few degrees above the horizon. The night was beautifully serene and cool. Though at but a little distance from the west of Africa, and on the limit of the torrid zone, the thermometer rose no higher than 64½°. The phosphorescence of the ocean seemed to augment the mass of light diffused through the air. After midnight, great black clouds, rising behind the volcano, shrouded, at intervals, the moon, and the beautiful constellation of the scorpion. We beheld lights carried to and fro, on shore, which were probably those of fishermen preparing for their labours.

The whole western part of Lanzarote, of which we had a near view, bears the appearance of a country recently overturned by volcanic eruptions. Every thing is black, parched, and stript of vegetable mould. We distinguished, with our glasses, stratified basalt in thin and steeply sloping strata.

At sun-set the ship was again under sail, but the sea was calm, a reddish vapour covered the horizon, and seemed to magnify every object. The black mountains of Graciosa appeared like walls of 500 or 600 feet; and their shadows, thrown over the surface of the ocean, produced a gloomy aspect. Rocks of basalt, emerged from the bosom of the ocean, appeared like ruins of some vast edifice: but the back-ground of the picture, the coasts of Lanzarote, presented a smiling aspect.

The vessel was now attempting to make her passage out between Allegranza and Clara; but the wind having fallen, the current drove her toward a rock, near Clara, on which the sea broke with violence, and which is noted in the old charts, under the name of *Infierno,* or Hell Rock. It is composed of a mass of lava, three or four fathoms high, and covered with scoriæ, resembling coke. We may presume that this rock was raised by volcanic fire, and may, heretofore, have been much higher. It is now generally called the *West Rock.*

As the fall of the wind, and the strength of the current, prevented a passage through the channel of Allegranza, an attempt was made to tack through between Clara and the West

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* The *medusa* is a genus of mollusca; its body is gelatinous, or jelly-like, spherical, and generally flat beneath; mouth central and beneath. There are 44 species. The larger species, when touched, cause a slight tingling and redness, and are usually denominated *sea-nettles.* They are supposed to constitute the chief food of cetaceous fish. Most of them shine with great splendour in the water. M. de Humboldt says that, the *sea-nettle* class is known by its brownish yellow colour, and by its tentaculæ, or arms, which are longer than the body. Several were four inches in diameter: their reflection almost metallic: their changeable colours, of violet and purple, form an agreeable contrast with the azure tint of the ocean.

Rock. This proved nearly fatal, for the current set so strongly toward the rock, that the sloop no longer obeyed the helm, and she was expected to strike upon it; but, the wind having freshened a little toward the morning, the vessel, at length, succeeded in passing.

Allegranza, Clara, and Graciosa, are now visited only for the orchilla, or archil, which is found upon them, and which is valuable for its use in dying. Clara is noted for its beautiful canary-birds, and it yields pasture for goats.

LANZAROTE is very high, and may be discerned at a great distance. On approaching, it appears black, rocky, and barren. It has three good harbours, the principal of which, called PUERTO DE NAOS, is on the south-east side. Any vessel, not drawing more than 18 feet, may enter it at high-water, spring-tides, and lie secure from all winds and weather; although, in sailing along the coast, the shipping appears as if at anchor in an open road, the harbour being formed by a ridge of rocks, not perceivable at any distance, as most of them are under water: these break off the swell of the sea, so that the inside is as smooth as a mill-pond. As there is no other convenient place in the Canaries for cleaning or repairing large vessels, it is much frequented for that purpose, by the shipping trading to the islands. At the west end of the harbour stands a square castle, built of stone, and mounted with some cannon, but of no great strength, for ships of war may approach within musket-shot of it. There is no town, but some magazines are erected, where corn is deposited, in order to be ready for exportation.

On the west side of the castle lies another port, called PUERTO DE CAVALLOS, and by some *El Recife*. This is also an excellent harbour, formed, like Puerto de Naos, by a ridge of rocks; but its entrance is shallow, there being no more than 12 feet of water in it, with spring-tides. The castle, before mentioned, is built upon a small island between the two harbours, and so defends them both: this island is joined to the land by a bridge, under which boats go from one port to the other; or from Puerto de Cavallos to Puerto de Naos.

At the north end of Lanzarote is a large spacious harbour, called EL RIO, which is the strait, or channel, dividing this island from the uninhabited one called *Graciosa*. A ship of any burden may pass through this strait; for, if she keeps in the mid-way, between the two islands, she will have 6 or 7 fathoms of water all along.

If a smooth place to lie in, while the trade-wind blows, be required, a ship coming into this harbour from the eastward must run a good way in, and double a shallow point, which lies on the starboard hand, taking care to give it a good berth; and this is easily done by approaching no nearer than in 4 fathoms; when past it, edge toward Graciosa, and anchor in any convenient depth; for it shoalens gradually toward the shore, close to which there are 2 fathoms.

This is a commodious place, in the summer season, for careening large ships; for a man-of-war, of any nation, that happens to be at war with Spain, may come here and unload all her stores, &c. on the isle of Graciosa, and heel and scrub. Or, if two vessels chance to come in together, the one may heave down by the other; in doing which, they need not fear any opposition from the inhabitants, for there is neither castle nor habitation near this spot.

The water, however, is not so smooth here as at Puerto de Naos, especially if the trade-wind happens to blow hard from the East, which sends in a swell that makes it troublesome, if not impossible, to careen a ship properly. But the wind here does not often blow from that quarter; those winds which mostly prevail being from North and N.N.E. In mooring here, great care must be taken to have a good anchor, with a large scope of cable toward Lanzarote; for in east and south-east winds, heavy gusts or squalls come from the high land of that isle. In the winter, the wind sometimes shifts to the S.W.; then it is necessary to weigh, and run back to the eastward, round the shallow point before mentioned, until the ship be sheltered from that wind, and there anchor.*

That part of Lanzarote, facing the harbour or channel of El Rio, is a high steep cliff, from the bottom of which to the shore is about two musket-shots distance. The ground, in the space is low; and here is a salina, or salt-work From the shore, there is no way of access into Lanzarote other than by climbing a narrow, steep, and intricate, path-way;

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* **Particular** plans of this Strait, and of the Harbours of Naos and Cavallos, are given in our Chart of **the Azores**, &c.

that leads to the top of the cliff, which it is scarcely possible for a stranger to ascend without a guide. Camels are used in Lanzarote, as beasts of burthen, on account of the scarcity of water.

The Island of Graciosa, already noticed, which lies on the north side of the channel El Rio, is about 5 miles in length, and 2 in breadth. It is destitute of water. The little Isle of Allegranza lies to the northward of this, at the distance of 6 or 7 miles. About 8 miles to the eastward of Allegranza and Graciosa, is a large high rock, called Roca del Este, or the East Rock; the Roca de Ouest, or West Rock, has been already described in page 30. Many ships have been wrecked upon these islands in the night, being misled by errors in their reckoning, by the currents, and also by these islands being improperly laid down in some charts, which place them nearly 30 miles farther South than they ought to be.

FORTAVENTURA, or FUERTAVENTURA.—The channel between this island and Lanzarote is called *La Bocayna;* on the south side of its eastern entrance, very near Fortaventura, lies the little island of *Lobos*, or Seal's Isle, which is about one league and a half in circumference, uninhabited, and destitute of water. Near this isle is a good road for shipping; the mark for which is, to bring the east point of Lobos to bear nearly N.E. by N., and anchor half-way between it and Fortaventura, or rather nearest to the latter. Although this road seems to be open and exposed, yet it is very safe with the trade-wind, for the water is smooth, and the ground every where clean, being a fine sandy bottom. Directly ashore from the road, on the shore of Fortaventura, is a well of good water, of easy access.

Through the broad channel, *La Bocayna,* ships sail very safely, as it is deep in the middle, and shoalens gradually toward Lanzarote, near to which are 5 fathoms of water; but very near or close to Lobos, the ground is foul and rocky. In this passage, vessels of any burthen may find room enough to ply to windward, and there is no necessity of approaching too near to Lobos.

When a vessel comes from the eastward, with the trade-wind, and is passing through the Bocayna, to the westward, so soon as she brings a high hill on Lanzarote directly to windward of her, she will be becalmed, and soon have the wind at S.W. Should this happen, make short tacks until you obtain the trade again, or a constant northerly wind, the first puff of which will come from West, or W.N.W. So soon as this is perceived, you must not stand to the northward, otherwise you will immediately lose it again, but must steer toward Lobos; for the nearer you approach this isle, the more will you have the wind; so that, before you are two-thirds over, you will meet with a steady wind at North, or N.N.E.

When there is a great westerly swell hereabout, the sea breaks horribly on the rocks at the N.W. end of Lobos. Captain Glas affirms that, he has seen breakers there nearly 60 feet high; of which, were one to strike the strongest ship, she would be staved to pieces in a moment. "When I first saw," says Captain Glas, "those mighty breakers, our ship had just passed through the channel, between Fortaventura and Lobos; we had a fine brisk trade-wind at N.N.E.; and, although there were no less than 10 fathoms of water, when we came into the westerly swell, yet we trembled lest the waves should have broken, and thought ourselves happy when we got out of soundings. We heard the noise of these breakers, like distant thunder, after we were past them 6 or 7 leagues."

The chief port of Fortaventura is *Gran Tarajal,* near the S.E. point of the island.

CANARIA, or GRAND CANARY.—The Isleta, or N.E. point of this island, lies 16 leagues N.W. by W. ¼ W. [*W. by N.*] from Point Handia, the S.W. end of Fortaventura; and, in clear weather, either of these islands may be seen from the other. The centre of Canaria is exceedingly high, and full of lofty mountains, which tower so far above the clouds, as to stop the current of the north-east wind that generally prevails here; so that, when this wind blows hard on the north side of the mountains, it is either quite calm on the other side, or a gentle breeze blows upon it from the S.W.* This island is the granary of the Canarian Archipelago, and has, in some districts, two wheat-harvests in the year, one in February, the other in June.

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* A description of these calms is subjoined to the present section.

On the north-east end of Canaria is the peninsula called the Isleta, 2 or three leagues in circumference; the isthmus, by which it is connected with the main island, is about 2 miles long, and a quarter of a mile broad at the narrowest part. On each side of this isthmus is a bay, which, being exposed on the N.W. side to the swell of the sea, is, therefore, an unfit road for shipping: but small barks get in between a ledge of rocks and the shore, and lie there smooth and secure from all winds and weather. Here the natives repair their small vessels.

On the other side of the isthmus is a spacious sandy bay, called by some, *Puerto de Luz*, and by others, *Puerto de las Isletas*, from some steep rocks, or islets, at the entrance of the bay, toward the N.E. This is a good road for shipping of any burthen, with all winds, except from S.E., to which it is exposed; but that wind, which is not common here, seldom blows so hard as to endanger a ship.

The landing-place is in the very bight or bottom of the bay, where the water is generally so smooth, that a boat may lie broadside to the shore without danger. Thence, along shore, about a league to the southward, is the city of PALMAS, the capital of the island. Shipping, that discharge their cargoes at Palmas, generally anchor, in good weather, within half a mile of the town, for the quicker dispatch; but that place is not a good road.

The next port of any consequence in Canaria is *Gando*, situated in the middle of the east side of the island. It is a good place for shipping with all winds, except from the southward; and there good water, with other refreshments, may be had.*

The city of Palmas appears to great advantage from the sea, the streets rising regularly above each other, which gives it a very commanding aspect. It extends, at least, a mile in length. There is another large town, with a lofty church, about 4 or 5 miles to the southward, which stands considerably higher and more inland than Palmas. From the number of houses seen, while sailing along the island, I should consider the population to be very considerable. It has also the appearance of being well cultivated.—*J. W. Monteath.*

TENERIFE, or TENERIFFE.—Point Naga, the N.E. end of Tenerife, bears N.W. ¾ N. [*N.W. by W.*] 15½ leagues from the north-east point of Canaria; but, from the western part of Canaria to the nearest part of Tenerife, the distance is 10 leagues. In the centre of the island is the famous peak, called, by the antient and present inhabitants, the *Peak of Teyde.*

On coming toward the island, in clear weather, this peak may be clearly discerned at a great distance; † it first appears like a thin blue vapour, or smoke, very little darker than the sky; at a farther distance the shade disappears, and is not distinguishable from the azure of the firmament. Before you lose sight of this towering mountain, it seems at a considerable height above the horizon, although, by its distance, and the spherical figure of the earth, all the rest of the island, the upper part of which is exceedingly high, is sunk

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* The pilots of Tenerife assert that a rock, with only 12 feet of water over it, lies W.N.W. 2½ leagues from Point Aldea, the western point of the Grand Canary, and that the sea breaks on it in rough weather. Its precise situation appears to be unknown.

† They say, in the Canaries, that the Peak, in very clear weather, is seen from La Bocayna, or the channel between the Isles of Lanzarote and Fortaventura, at the distance of about 50 leagues.

"The Peak of Tenerife is probably the most striking monument of nature in the world; for though the Chimborazo (in South America) soars to the height of 22,000, and the Himalayan Dewalgiri (in Asia) to the astonishing height of 27,000, while Tenerife is but 12,176, yet the latter, by its arising directly from the level of the sea, is seen more conspicuously, and stands at a more magnificent elevation. The view from the summit, which it requires a whole day to ascend, is unspeakably grand. On the top of this vast pyramid of basalt is a crater forty yards deep, from which vapour continually ascends, and specimens of finely-crystallized sulphur are gathered round its lips. From this summit, when the sky is unobscured, the whole island is seen like a model. Rising round it, at a distance, are seen the Canaries, glittering on the horizon, their peaks and pinnacles coloured by every change of day. At favourable times Madeira and the African Coast are visible."—*Captain Alexander,* 1837.

M. de Humboldt says, "It may be admitted, in general, that the Peak of Tenerife is seldom seen at a great distance in the warm and dry months of July and August; and that, on the contrary, it is seen at very extraordinary distances in the months of January and February, when the sky is slightly covered, and immediately after a heavy rain, or a few hours before it falls."

beneath the horizon. But, in general, in sailing toward Tenerife, when the trade-wind blows, the island appears as a haziness of the sky, or as a cloud, till within the distance of 5 or 6 leagues, and then the headlands shew like land, and are first conspicuous.

TENERIFE presents to the curious eye the most singular object, perhaps, in the northern hemisphere. The island appears, on sailing along the coast, from north to south, to have once been a complete cinder; and presents to view a great deal of the brokenness and irregularity of half-consumed coke. This resemblance, however, contrary to expectation, becomes less perfect as we approach the peak, the great chimney of the fiery cauldrons boiling beneath.

M. Humboldt's ascent of the Peak is given in the Nautical Magazine, No. 47, Jan. 1836; and it is there stated that the volcano has not been active at the summit for thousands of years, its eruptions having been from the sides; the depth of the crater being only about 120 feet. The Peak forms a pyramidal mass, having a circumference at the base of more than 57,105 fathoms, and a height of 12,176 feet, or rather more than two geographic miles. Two-thirds of the mass are covered with vegetation, the remaining part being sterile, and occupying about ten square leagues of surface. The cone is very small, in proportion to the size of the mountain, it having a height of only 537 feet. The lower part of the island is composed of basalt and other igneous rocks of antient formation, and is separated from the more recent lavas and the products of the present volcano by strata of tufa, puzzolana, and clay.

At a short distance from Point Naga, the N.E. point of Tenerife, are some high perpendicular rocks; and 4 or 5 leagues thence, on the east side of the island, is the bay, or roadstead, of SANTA CRUZ, the most frequented of any in the Canaries.* The best road for shipping here is, between the middle of the town and a fort, or castle, about a mile to the northward of it. In all that space, ships anchor, from a cable's length distance from the shore, in 6, 7, and 8, fathoms of water, to half a mile, in 25 or 30 fathoms. Particular care must be taken, in going in, not to bring any part of the town to the northward of West, lest calms should be occasioned by the high land under the Peak; otherwise you will be in danger of driving upon the shore; and, when ashore, will have no ground on the opposite side of the ship, with 200 fathoms of line, so that anchors and cables are of no use.

When a ship lies any time in the road, it is necessary to buoy her cables, otherwise the ground, being in some places foul, may chafe and spoil them. Here vessels, if moored with good cables and anchors, may lie securely in all winds, although the bay is exposed and open to those which blow from the N.E., East and S.E.; however, it is not above once in the space of four or five years that they blow so hard as to cause any considerable damage. The surf frequently beats on shore, with great violence, for several days together; and the pier is ill-contrived for shelter.†

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* QUARANTINE REGULATIONS, 20th Nov. 1832.—On the appearance of a British ship, a boat with a pilot, and carrying the Royal Spanish flag, will leave the mole, and point out the Quarantine anchorage. If from circumstances it should be necessary to anchor before communication can be had with the boat, the line of quarantine anchorage is S.E. and N.W. by compass, with the mole-head, (nothing to the north of it); distance from two to six cables' length from the land; the depth of water 10 to 20 fathoms, rocky. Anchorage to the north of the line stated is for vessels admitted to free pratique. No ship is to lower boats or communicate in any manner whatever until visited by the health-boat and permission obtained. Ships bound to any port in any of the Canary Islands from infected countries, must come to this bay, which is exclusively appointed for the observance of quarantine.—*Santa Cruz, Tenerife,* 20th Nov. 1832.

† "The BAY OF SANTA CRUZ is much exposed to all winds between E.N.E. and S.W. by W.; and, as the easterly winds are very prevalent, there is generally a great swell setting in, although it seldom blows hard from that quarter of the compass.

"In 17½ fathoms, fine sand and blue clay, directly off the jetty, with the end thereof on with the gateway leading into the town, bearing about N.W., is a convenient berth for watering, and good ground.

"The jetty is built on a curve, to break off the swell, for the convenience of boats, being the only landing-place, where all goods are landed and shipped. Ships generally lie off the jetty, in from 17 to 35 fathoms, good holding ground. The best mark is, the high square building like a light-house just over and in one with the mole or jetty-head.

"Tide rises about 4 feet; sets round the bay.—H. W. 4 h. 30 m. (?)"—*Mr. Wm. Wood, H.M.S. Tartar,* 1823.

Captain Vancouver anchored here, in 1791, and, in relation of his voyage, has stated, "We had the mortification, this morning, (May 1st,) of finding the small bower cable cut through nearly in the middle, which seemed to have been occasioned by an anchor lying at the bottom. The loss of an anchor, where no other could be procured, was a matter of serious concern; no pains were spared to regain it until the afternoon of the 5th, when all our exertions proved ineffectual; and, being apprehensive that other lost anchors might be in the vicinity, we weighed, went farther out, and again anchored, in 30 fathoms, on a soft, dark, oazy, bottom, intermixed with small white shells, having the northernmost church-steeple in a line with the centre of the jetty, bearing (by compass,) N. 48° W., and the southernmost fort S. 71° W., about three-quarters of a mile from the town. This anchorage appeared to be so far preferable to our former situation, being nearly as convenient to the landing-place, without the hazard of damaging the cables by anchors which small vessels might have lost nearer in-shore; and which is the only danger to be apprehended here, as the bottom is good holding-ground, and, to all appearance, perfectly free from rocks."

Captain Vancouver has observed, that, when he was here, he found the wine, water, and beef, exceedingly good, and was therefore induced to take some days' supply of the latter to sea; but fruit, vegetables, poultry, and all kinds of live-stock, were very indifferent, and most extravagantly expensive.

The water is easily procured when the surf is not great on the beach. A good supply of wine may, also, be readily had.

The aspect of Santa Cruz is gloomy, and the heat is commonly excessive. On a narrow and sandy beach, houses of dazzling whiteness, with flat roofs, and windows without glass, are struck against a wall of black perpendicular rocks, stripped of vegetation. A fine mole, built of free-stone, and the public walk, planted with poplars, are the only objects which break the sameness of the landscape.

Captain Owen has said, Our approach by night, [toward Santa Cruz,] was past a line of fishing boats, each of which had a fire of Canary pine at the bow and stern, which produced a beautiful effect; and as they anchor to fish on the outer verge of the bank, they are good marks for vessels, being sure of soundings when in the same line with the fishermen's lights. Immediately on anchoring they brought their fish alongside for a market. It consisted principally of a species of horse-mackerel, caught with rod and line.

The situation of Santa Cruz appears badly chosen, as regards anchorage for ships, the communication with the shore, and obtaining water; in all which particulars the next bay, about a mile to the eastward, has great superiority. The town is small, and at a distance presents a rugged and barren appearance.

Santa Cruz is frequented by outward bound ships for the purpose of obtaining a stock of wine, which can be procured at a cheaper rate, and frequently of as good a quality, as that of Madeira. At the time of the *Chanticleer's* visit in 1828, the price of very good wine was £20. the pipe of 100 imperial gallons; this was called the "London particular;" but the best old wine was only £12. the pipe, and it, in general, cannot be distinguished from the ordinary wines of Madeira.

Admiral Krusenstern says that, of Santa Cruz the characteristics are, the general misery of the people, the gross depravity of the female sex, and the swarms of fat monks, who stroll about the streets as soon as it is dark. These objects excite, in the mind of a stranger, the sensations of pity and disgust.

"Upon the arrival of the Russian frigates toward the Road, in 1803, Don Carlos Adam, Lieutenant of the Spanish Navy and Captain of the Port, came immediately on board, and recommended us to keep to the eastward of the road, as the best place of anchorage, where we brought-to in 36 fathoms. The ground is not so rocky here as it is in other parts of the road, nor are there so many lost anchors in the ground, which is frequently the occasion of the loss of others."

From this cause, the Neva, which lay more to the S.W., lost a sheet-anchor and two cables, while the Nadeshda's cables did not suffer in the least. It is, however necessary to take the precaution of buoying them up with casks to keep them floating; I would recommend this situation in preference, notwithstanding the great depth of water, and will therefore give the exact situation of the ship after we had let go our other anchor to the N.E. in 24 fathoms of water. The N.E. point of the road bore N. 69° E.; the S.W. point, S. 36° W.; and the church of St. Francis, which is distinguished by a very high tower, S. 51½° W.

S. 51½° W. These is, indeed, this disadvantage attending the situation, that should a storm spring up at S.W., and the ship not like to ride it out in the road, it would be very difficult for her to beat out. Violent storms, however, are not common, even in winter; and, if the anchor and cable can be depended upon, it is better to remain in the road. The Spaniards, and they alone, moor with four anchors; two to the N.E. and two to the S.W., in compliance with an antient law.

The mean of the several observations, which were taken in the road, made the latitude of our anchorage to be 28° 27′ 33″; and the longitude, by Arnold's large watch, No. 128, 16° 12′ 45″. The true longitude, as settled by the Chev. de Borda and M. Varela, is 16° 15′ 50″.*

OROTAVA, &c.—The next best port to that of Santa Cruz is the port of *Orotava*, on the western side of the island, and which lies about 8½ leagues to the south-westward of Point Naga. Here the riches and fertility of the island are chiefly to be found, for here the wine is mostly made, and shipped when the weather allows. It is a good harbour in the summer-season, or from the beginning of May to the end of October; but in winter, ships are often obliged to slip their cables, and put to sea, lest they should be surprised by a N.W. wind, which throws in a heavy sea: luckily these winds rarely happen; and, in general, give warning, so that a vessel has time to get away. Straggling rocks project about two ships' length from shore, on which the sea breaks furiously. It is commonly calm in the road, but there is almost always a long northerly swell, that causes ships to roll very much.

The anchorage is in 50 fathoms, about a mile and a half from shore, with the peak bearing S.W.; and it is proper to continue a pilot on board whilst lying here.

ADVICES from TENERIFE, dated the 11th of November, 1816, stated the great embarrassments foreign ships have to encounter on their arrival at that island, from want of a knowledge of the regulations to be observed. Almost all the British vessels, and particularly the East-India-ships, which have had occasion to touch at the island for refreshments, have been subject to a heavy expense, and much vexatious delay, by the want of bills of health, and by other omissions. To prevent inconvenience, it is necessary to observe the directions for British vessels frequenting the island of Tenerife. The directions are as follow:—

"A bill of health is an indispensable document for a vessel's admission here, from whatever port she may arrive. The quarantine-laws are very rigorously enforced, and the want of a bill of health subjects vessels, even from England direct, to a quarantine, that is never removed without the ceremony of repeated health-visits, and payment of heavy fees. Great care must be taken not to get to leeward of the island, as it is a tedious and difficult matter to get up again, the usual and prevalent winds being between N.N.E. and E.N.E. Point Naga should be made, which is the N.E. point of the island, and is very high, and is easily to be known by two large high rocks lying close to it, which appear like ships, and may be seen seven or eight leagues off. You must then run down till you come within two or three leagues; and if bound to Port Orotava, you must steer down along the north shore, (which is very bold, and quite free from danger,) keeping two or three leagues distance; and, after running down eight or nine leagues, if you should not see the Peak, which is often clouded, you will see a large white town (Orotava) on the side of the high land, about a league inland, with two small regular-shaped green hills under it, between which you must steer directly in, and, by doing so, will raise, as it were, another town out of the sea; this is Port Orotava, for which you must steer directly in, until you meet the pratique-boat, which will be about two or three miles off; it is a low boat, and comes with the Spanish colours set upon a staff: at any rate, you must not be afraid of running in for the land, as it is very deceiving, and you will be four or five leagues off when you do not think yourself so many miles; and in that case you will not soon get a boat, for they do not come off until you approach very near. The boat, when she comes, brings a pilot, and leaves him on board: you must also bring with you your register, pass, clearances, &c.; and you must take care not to deliver either letters or other papers (except your bill of health) to any person who may ask for them, without some document, either from your consignee or the consul.

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* REMARKS of CAPTAIN LISIANKY, of the Neva.—"The bay of Santa Cruz is not a safe anchoring place, especially in winter; from its being open to the S.E. a quarter from which the wind sometimes blows with great violence. To this may be added, that it has, in many places, a rocky bottom, and abounds so much with lost anchors and warps, that it is necessary to buoy up the cables to prevent their chafing; we found three small casks to each of our cables to be sufficient for the purpose. We were moored S.S.E. and N.N.W., having Fort Christoval N. 81½° W., South-Fort S. 55½° W., and St. Raphael N. 5° E.; and the only damage we sustained was the loss of a warp, which we could not heave up when we unmoored.

"To come into the bay, you must sail close in-shore, after passing around the N.E. part of the island; and you should endeavour to get bottom as soon as possible; for which purpose a heavy lead with fifty fathoms of line should be in readiness. The shore here is very high, and so deceiving, that, when I thought myself four leagues from it, I afterwards found, by my run, that I had been mistaken by nearly half that distance.

"During our stay here, the peak was so constantly overclouded, that we could see it distinctly only twice. The summit was then (in October) covered with snow; but this is not the case, we were informed, in the months of June and July. The latitude of our anchoring-place, according to the different meridian altitudes, appeared to be 28° 26′ 36″ N."

In 1820 or 1821, H.M. Ship Tartar anchored in the Road of Santa Cruz, in 26 fathoms, dark sand and mud, with the S.W. point of Santa Cruz, S.W. ½ W., the church in the middle of the town W. by N. ½ N., and the easternmost battery N. by E. ½ E.—At a mile and a half without the ship, no bottom at 150 fathoms. Stock of all kinds was then plentiful; the bullocks large, weighing from four to seven hundred weight. Ships in want of water can always be supplied, on moderate terms, by the boats belonging to the place.

"In running down, you must prepare your anchors and cables, and it is customary to bend your small bower cable, with which you will bring up, with only one turn round the windlass, in order that it may run out quick, as the spot where you ride (about half a league off, and to the westward of the town) is very small; and if there be many vessels there, it is necessary that your anchor go very quick, as you bring up in from 30 to 40 fathoms of water; but there is little or no tide, and she will bring up easily. You must give her the whole cable round the windlass; your buoy-ropes should, therefore, be 45 fathoms long. During the summer months, from April to October, all vessels are moored in an inner harbour, or creek, with iron chains, kept by the merchants for that purpose. Vessels that fall to leeward very often lose much time by mistaking Garachico for Port Orotava, from whence it is distant four and a half leagues West. There is some similarity in the appearance of these places, Garachico having also above it a white town, inland, called Icod; but besides, by their situation, Garachico being much nearer Point Teno, the west point of the island, these places are very easily distinguished by the above-mentioned two equally-formed round green hills. Point Naga lies in 28° 36′, and the Salvages lie *true* North from the point, distant about 28 leagues.

"The Grand Salvage is very high, and may be seen ten or twelve leagues off. Your direct course from the Grand Salvage to Port Orotava is S.W. (by compass) and distance 38 leagues; but particular care must be taken not to fall to leeward. The Peak of Tenerife may sometimes be seen forty leagues off, but it is very often hidden by clouds. Should it happen in the winter that you arrive off Port Orotava, during a N.W. or N.N.W. gale, which rarely occurs, but throws in a very heavy sea upon the coast, and would prevent a boat going off to you, it is best to bear away for Santa Cruz, on the S.E. side of the island, after doubling Point Naga.

"Santa Cruz is the preferable place to touch at, for vessels in want of water and refreshments. All vessels, on approaching these ports, ought to hoist their colours, and show their consignee's signal; or, when unconsigned, and only visiting the island, a Union Jack at the fore, and a white flag with a pennant over it at the main, in order that boats may be early sent off to them by their consignees, or by the consul."

PALMA.—From the western end of Tenerife to the nearest part of the Island of Palma, the distance is about 15 leagues. The summit of this island is higher than the general level of Tenerife, its peak excepted; hence some navigators run toward it with great confidence in the night.

The chief port is that of Santa Cruz, on the east side of the island. The mark by which a stranger may find it is the following:—When he approaches the east side of the island, Palma will appear shaped exactly like a saddle. Let him steer so as to fall in a little to windward of the lowest place, or middle of the saddle, till he comes within a mile of the land; then, running along shore to the southward, he will perceive the town close by the sea-shore, and the shipping lying in the road; but, as the land behind the town is high and steep, one cannot discern the shipping till within a mile of them. The road is within a musket-shot of the shore, where vessels commonly ride in 15 or 20 fathoms of water, and are exposed to easterly winds; yet, with good anchors and cables, they may remain with great safety in all winds; for the ground is clean and good, and the great elevation of the island, with the perpendicular height of the land facing the road, repels the wind that blows upon it, though ever so strong.

When there is a great north-east swell at sea, it comes rolling into the bay, but the want of wind, and the deepness of the water, deprive it of strength or power; so that ships, in such a case, ride here with a slack cable. These circumstances render the road of Santa Cruz, in Palma, more secure than any of those of Canaria or Tenerife; but, in the winter, the rolling swell, which comes into the bay, breaks high upon the beach, and prevents boats from going off, or landing, for the space of three or four days together.

Santa Cruz de la Palma is a large town, but not so good and large as that of Palmas, in Canary, or the towns of Tenerife. Near the mole is a castle, or battery, mounted with a few cannon, for the defence of the shipping, &c. In the middle of the town, near the great church, is a fountain, filled by a rivulet, which plentifully supplies the inhabitants with good water.

Tassacorta, the port next in consideration to that of Santa Cruz, is on the S.W. part of the island; it is exposed to westerly winds, and little frequented by any vessels excepting boats.

In all the island there is no town of any note, excepting Santa Cruz; but many villages, the chief of which are St. Andrea and Tassacorta. In the north-eastern part, inland, is a remarkable high mountain, called La Caldera, or the Cauldron, being hollow, like the Peak of Tenerife.

GOMERA.—The middle of Gomera lies W.S.W. about 5 leagues from Point Teno, of Tenerife. St. Sebastian, the principal town, is situated close by the sea-shore, in the bottom of a bay, on the eastern side, where shipping lie land-locked from all winds, except the S.E. Here you may anchor at a convenient distance from the shore, in from 15 to 7 fathoms; but, as the land-wind frequently blows hard, it is necessary for a ship to moor with a large scope of cable, otherwise she will be in danger of being blown out of the bay. The sea here is generally so smooth, that boats may land on the beach without danger. On the north side of the bay is a cove, where ships of any burthen may haul close to the shore, which is a high perpendicular cliff, and there heave down, clean, or repair. When boats cannot land on the beach, on account of the surf, they put ashore on this cove, from whence there is a pathway along the cliff to the town.

The town has plenty of good water, which is drawn from wells in every part of it; and, in the winter, a large rivulet from the mountains empties itself into the port. On the south side of the mouth of this rivulet stands an old round tower; and on the top of its perpendicular cliff, on the north side of the cove, is a chapel, and a battery, with a few pieces of cannon for the defence of the port.

To the best of my remembrance, says Capt. Glas, the land that forms the north point of the bay is the most southerly point of land, on the east side of Gomera, that can be seen from Point Teno, on Tenerife. That land, when one is to the northward of it, at about a league distant, bears a great resemblance to Rame-head, near Plymouth Sound. In going into the bay, it is necessary to stand close in with this point, for the land-wind is commonly too scanty for a ship to fetch the proper anchoring-place; from that reason it is better to come in with the sea-breeze, which generally begins to blow here about noon.

The best place for a ship to lie in here is, where a full view may be had along through the main street of the town, and at about the distance of a cable's length from the beach: it is necessary to moor as soon as possible, because of eddy winds that sometimes blow in the bay.

FERRO.—This island, the westernmost of the Canaries, has neither road nor harbour worthy of particular description. It has one church, but the town is inconsiderable. The land rises steeply from the sea, and is craggy on all sides for about a league, so as to render the ascent very difficult. It produces, however, many trees and shrubs, with better grass, herbage, and flowers, than any of the other islands, so that bees and honey abound. The wine is poor, and there are only three fountains or springs of water on the island.

DIRECTIONS *for* SAILING *among the* CANARY ISLANDS,

by CAPT. GLAS.

IF a ship, lying at Palma, wants to go to Lanzarote, and will not wait for a fair wind, (which, indeed, seldom blows there, especially in the summer-season,) let her stand over to the N.W. side of Tenerife, and beat up along shore until she weathers Point Naga; thence, with the wind that generally prevails in these parts, she will be able to weather Canaria, and fetch the Point of Handia, or Fortaventura, or perhaps Morro Gable, (the southern point,) whence it is easy to beat up to Pozzonegro, along the east side of the island, because the sea there is always smooth. It is not quite so easy to beat up from Pozzonegro to the Isle of Lobos; yet it may be done, without difficulty, when the weather is moderate; if the wind should happen to blow hard, she may stop in the Bay of Las Playas, until it proves more favourable.

From the Isle of Lobos she will find no difficulty in beating up to Porto de Naos, in Lanzarote. It is not advisable for those who are not perfectly well acquainted with that harbour, to attempt to conduct a ship in, because the entrances are very narrow.

It is common for ships, which come loaded from Europe to Santa Cruz, Tenerife, &c., to have part of their cargoes to unload at Port Orotava: these ships, when the trade-wind blows hard, will sometimes find it impracticable to weather Point Naga: when this is the case, bear away to the leeward point of the island, and keep near the shore, where, if you do not meet with a southerly wind, you will be carried by the current, in the space of 24 hours, from the S.W. point of the island to Point Teno, whence you may easily beat up to Port Orotava; for, when the wind blows excessively strong at Point Naga, it is moderate weather all the way from Point Teno until within 2 or 3 leagues of Point Naga. But I would not advise a ship to bear away as above directed, unless when the trade-wind blows so fresh that she cannot weather Point Naga: because, in moderate weather, there is little or no wind stirring on the coast between Teno and Port Orotava.

The COAST of AFRICA, east of the Canaries, is level, and is rendered inaccessible by a heavy surf, which breaks on it continually. The Canarians, in the sea between this coast and the islands, employ a number of vessels to fish for bream and cod.

Of the CALMS *of the* CANARY ISLANDS. *(By the same.)*

IT has been already noticed, in the description of the Island of Canaria, "That its mountains tower so far above the clouds, as to stop the current of the north-east wind that generally blows here; so that, when this wind blows hard on the north side of the mountains, it is either quite calm on the other side, or a gentle breeze blows upon it from the S.W. These calms and eddy-winds, occasioned by the height of the mountains above the atmosphere, extend 20 or 25 leagues beyond them to the S.W. There are calms beyond, or to leeward of, some of the rest of the islands, as well as Canaria; for those of Tenerife extend 15 leagues over the ocean, the calms of Gomera 10, and those of Palma 30. "I have," says Captain Glas, "been frequently in all the calms of the islands, excepting those of Palma; and, from my experience of them, I may venture to say, that it is extremely dangerous for small vessels, or open boats, to venture within them when the wind blows hard without. It is true, indeed, the wind raises the waves of the sea to a mountainous height: yet those waves follow each other in regular succession; for, were they to fall confusedly one against another, no ship would be able to sail on the ocean. But, in a storm, the wind driving the sea before it, each wave gives place to the one which follows; whereas, in the calms in the Canary Islands, the sea not moving forward in the same direction with the sea without, but being as it were stagnant, or at rest, resists the waves that fall in upon it from without; and this resistance causes them to break just in the same manner as the billows break upon the sea-shore, but with less violence, on account of the different nature of the resistance. This breaking of the waves is only on the very verge of, or just entering into, the calms; for within them the water is smooth and pleasant.

"Upon first coming into the calms, the waves may be seen foaming and boiling like a pot, and breaking in all directions. When a vessel comes amongst them, she is shaken and beaten by the waves on all sides, in such a manner, that one would imagine that she could not withstand their force; however, this confusion does not last long. The best way to manage a ship entering the calm is, immediately to haul up the courses, and diligently attend the braces, to catch every puff of wind that offers, in order to impel the ship into them as soon as possibl possible. The crew must not think it strange to be obliged to brace about the yards every two or three minutes, according as the wind veers and hauls; but, after a ship is once fairly into the calms, she will either find a dead calm and smooth water, or a pleasant and constant breeze at South or S.W., according as the wind blows without, to which this eddy-wind, as it may be called, always blows in an opposite direction."

3.—THE SARGASSO SEA.

By the Sargasso Sea is meant that portion of the ocean distinguished by the weed called *fucus natans*, or floating weed. The name was imparted by the early Portuguese navigators, who called it *Saraçao* or *Sargusso*, from the form of the seed pods, or fruit of the plant, which have been called *tropical grapes*.

The fucus natans, commonly called *Gulf-weed*, occupies a vast space between the parallels of 37° and 18° N., and between the meridians of 30 and 43° W. This space is commonly studded over, like an inundated meadow, with the bushes, which are in some places very abundant, and in others more dispersed. If we could imagine the surface of a wide extended moor, covered with water, the furze and heath bushes would appear something like the clusters of fucus scattered over the thickest part of this sea.—*Atl. Mem.* 146.

This weed was met with in large quantities by Colombo; and it is said that the old navigators, *Thevet* and *De Lery*, were fifteen days in passing through extensive fields of it which they fell in with near the tropic of Cancer.

We cannot, at present, assign with certainty the place of its growth, nor satisfactorily account for its appearance in the situations in which it is found.

That it grows at the bottom of the sea, in situations not yet defined, appears to be a fact; but at what depths, and in what manner, is unknown. It is almost surprising that a regular examination has never yet been made, by which the question might have been determined, although of no consequence in actual practice.*

It seems to be generally admitted that a great proportion of the weed is brought from the Mexican Sea. Captain Livingston, in his way from New Orleans to the Strait of Florida, saw large quantities of it; and every one that has navigated the Gulf-stream has remarked the weed in it, or along its borders. Sir Philip Broke and the Baron Alexander de Humboldt say that the stream contains a great deal. Sir Philip says, "We were always surrounded with gulf-weed." Major Rennell adds, "He spoke of that part of the Gulf-stream out in the Atlantic: the others might speak of other parts."

The weed found in the Gulf-stream appears to be supplied from a great bed seen in the Mexican Sea, by Lieutenant Evans, 17th of April, 1828. This bed will be considered, by many of our readers, as the primary bed of the fucus, and it is unquestionably one from which the Gulf-stream is occasionally supplied.†

On the weed found in the ocean, we have the following remarks, by *Captain Livingston*, whose name has so frequently occurred in the preceding pages.

"Many persons suppose that the Gulf-weed *(fucus natans)* grows upon the rocks about the Bermudas, others that it originates among the Florida Reefs, and a third party that it grows upon the water, without ever adhering to any thing fixed.

"All these positions seem to me equally wide of truth. Neither on the Bermuda Rocks, nor among the Florida Reefs, has a single branch of Gulf-weed ever been found growing upon the rocks; and, among all the Gulf-weed met on the ocean, no person has ever found a single tuft with roots, or that, on mature examination, could be supposed, by any person of sound judgment, to have grown on the surface of the water. On the contrary, every stalk of the weed seems to have been broken off short from something to which it firmly grew, and *all the ends* of these stalks are uniformly decayed, or dried up, from the end to a short distance.

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* A description of the weed, as written by Mr. Turner, is given in the *Nautical Magazine*, June, 1832, illustrated by an engraving of a very singular fish, from its size and figure called a *toad-fish*, and found among the weed, as well the little but well known fish, called the *pipe-fish*.

† "On the outer passage to Vera Cruz we met, for the first time, with the sea-weed in lat. 33° 55′ N. long. 16° 26′ W., and on the homeward passage, the last piece in 43° 51′ N., and 43° 20′ W. The latter on the northern edge of the Gulf-stream."—*J. Evans.* (*Lt. R. N.*)

"I am of opinion that the Gulf-weed grows in the centre of the immense eddy or whirlpool, formed by the inclination of the water to the westward, caused by the influence of the trade winds, between the latitudes of about 6° to 22° North, and the Gulf-stream, &c. between the parallels of 22° and 34°; that it *grows on the rocks at the bottom of the ocean*, in the Sargasso or Grassy Sea, in the space comprehended between the 22d and 34th parallels of latitude, and the 26th and 58th, or 60th meridians of longitude, West of Greenwich; that the stalks decaying, or being broken off by some agitation of sea near the roots, the tops rise to the surface of the water.

"It has been stated, as a well-known fact, that the *fucus natans* grows on the rocks along the Gulf of Paria, and on the coasts of Caraccas, &c. If this be the case, it is rather strange that it should not grow on other rocks and coasts of the West Indies. It has also been stated that, in the whole sea of floating-bushes, *Mar do Sargasso*, not a withered plant is ever discovered. This is not true, as I have seen abundance of the *fucus natans* in a state of great decay. I note the following from my journal of the *Brilliant*, from Gibraltar toward Havanna: 8th Feb. 1819, 'the weed much decayed:' 9th, 'weed passed through, *a. m.*, much decayed:' 10th, *p. m.*, 'passed through much decayed weed; I remark, that the farther we run to the westward, the more decayed is the Gulf-weed:' 13th, 'the Gulf-weed begins to look fresher.'*

"These particulars have been given, in order to show that I have not spoken at random, but, on the contrary, actually made my remarks on the spot. Some of the weed was quite brown, and in small fragments; evidently separated into such by its state of decay. It is true that the weed soon decays when it is taken out of the water, as I have often tried the experiment. The weed is never of a verdant green colour, but seems as if blanched from having been, in some degree, hid from light: I suppose from vegetating under water."

Let us now read what M. de Humboldt says upon the same subject.

From the depth of about 30 fathoms, in the channel, between Clara and Allegranza, to the northward of Lanzarote, a curious species of sea-weed was brought up from the bottom of the sea: the stem of a brownish colour, and three inches long; had circular leaves of a *tender* green, with lobes, and indented at the edge. The vine-leaved fucus, he adds, presents a phenomenon of great interest; fixed to a piece of madrepora, this sea-weed vegetates, at the bottom of the ocean, at the depth of 192 feet, notwithstanding which its leaves are as green as our grasses.

"Mr. Turner, who has so well made known the family of the sea-weeds, and many other celebrated botanists, think that the greater part of the *fuci* (weeds) which we gather on the surface of the ocean, and which from the 23d to the 35th degree of latitude, and 30 of longitude, appear to the mariner like a vast inundated meadow, grow primitively at the bottom of the ocean, and float only in their ripened state, when they are torn off by the motion of the waves."

"To the north of the Cape Verde Islands we met with great masses of floating sea-weeds. They were the tropic grape, *fucus natans*, which grows on submarine rocks between the equator and latitude 40°, both north and south. I am assured from the comparison of a great number of journals, that, in the basin of the Atlantic Ocean, there exist two banks of weeds, very different from each other. The most extensive is a little to the west of the meridian of Fayal, one of the Azores, between lat. 25° and lat. 36°. The temperature of the ocean, in these latitudes, is from 61° to 68°; and the north winds, which sometimes reign there very tempestuously, drive floating isles of weed even to the parallels of 24 and 20 degrees. The vessels which return to Europe, either from the Rio Plata or the Cape of Good Hope, cross these banks, which the Spanish pilots consider as at an equal distance from the Antillas and Canaries. The second bank of fuci (weed) is but little known; it occupies a much smaller space between the 22nd and 26th degrees of latitude, eighty leagues east of the meridian of the Bahamas. It is found on the passage from the Caicos to the Bermudas. In the latitudes just described, the fuci, far from being fixed to the bottom, float in separate masses on the surface of the water. In this state the vegetation can scarcely continue a longer time than it would do in the branch of a tree torn from its trunk; and, in order to explain how moving masses are found, for ages, in the same position, we must admit that, they owe their origin to submarine rocks, which, placed at the depth of 40 or 60 fathoms, continually supply what has been carried away by the currents. *It is not the Gulf-Stream, as some mariners think, which accumulates the fucus to the south of the Azores.*

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* On the 8th of February the *Brilliant* was in 24° 17′ N. and 65° 1′ W. On the 9th, in 24° 34′ N. and 66° 59′ W. On the 10th, in 24° 51′ N. and 68° 39′ W. On the 12th, in 25° 34′ N. and 71° 5′ W. On the 9th, the ship passed the meridian of Porto-Rico, and was hence proceeding toward Providence Channel, Bahama. The decayed weed, we have no doubt, had drifted from the central bed of the ocean.—Ed.

"It were to be wished that navigators would heave the lead more frequently in the latitudes covered with weeds.

"The causes that unroot these weeds at depths where it is generally thought the sea is slightly agitated, are not sufficiently known. It has been said that, if the fucus adhere to the rocks with the greatest firmness before the display of its fructification, it separates with great facility after this period, or during the season which suspends its vegetation, like that of the terrestrial plants. The fish and the molluscæ, that gnaw the stems of the sea-weeds, no doubt contribute also to detach them from their roots.

"On proceeding hence, toward the West-Indies, from the 22nd degree of latitude, we found the surface of the sea covered with flying-fish, which threw themselves up into the air 12, 15, or 18 feet, and fell down on the deck. I do not hesitate to speak of an object, of which voyagers discourse as frequently as of dolphins, sharks, sea sickness, and the phosphorescence of the ocean. None of these objects can fail of affording interesting observations to those who make them their study."

Mr. Luccock, in his '*Notes on Brasil,*' has likewise described the *Green or Weedy Sea.* He states that it extends from 11 to 35 degrees of north latitude, and from 30 degrees of longitude, to an indefinite distance westward. "Here," he says, "the ocean is covered by nodules of sea-weed, from 3 to 18 inches in diameter, somewhat resembling, in form, a cauliflower when stripped of its leaves. They float lightly upon the water, in parallel lines, at a very few yards from each other, and have a yellow-brown colour, like the long stringy fibre which is sometimes seen floating in the English Channel, and which I suppose to be the natural colour of all marine plants growing deeply beneath the surface of the water.

"Sailors say that this weed grows in the Gulf of Mexico; that it passes round Cape Florida with the stream; and, proceeding between Bermudas and the Western Islands, settles in the eddy of that vast current which encircles the northern Atlantic. To me however this hypothesis appears to be inadmissible, not only because there is an evident absurdity in supposing that plants may move rapidly in a still water, which the word eddy here must signify, but because it is impossible for the floating body to move faster than the current does, and in a direction differing from the set of the water.

"It is more reasonable to suppose that the plants grow nearly on the spot over which they float; that those which appear on the surface of the water are only the heads, or minor branches, of others, which flourish beneath; that they are broken off by the agitation of the ocean, or some other accidental circumstance, perhaps by the buoyancy of the seed-vessels themselves, which at a great depth, must be fully sufficient for the purpose, as it enables them to float lightly even on the surface of the water. There the plant is exposed to the sun, the seed ripens, the pod bursts, and the contents descend again to form new plants; while the old ones decay and furnish manure, according to the established economy of nature among vegetables, both terrestrial and aquatic.

"In the month of October I have run with a fine schooner, due North, through the N.E. trades, in the longitude of 26°, and found no weed, being perhaps to the east of it. In the month of March, on board a different vessel, we formed a diagonal line, from 26° to 44° West, across the parallels from 11 to 44 degrees, and saw a great quantity of it. In May, of another year, along the same track, there was much less observed; yet I dare not say that these dates are sufficient to point out the season of ripening, maturity, and decay, of the plant; although I have never taken up a nodule which was not full of seed-pods, and never heard of a person who had noticed one destitute of them."

4.—THE CAPE VERDE ISLANDS.

The CAPE VERDE ISLANDS derive their name from the nearest point of the Coast of Africa, and consist of the Ilha de Sal, or Salt Island; Bonavista; Mayo, or the Isle of May; St. Iago; Fuego, or Fogo; Brava; St. Nicolas; Sta. Lucia; St. Vincent; and St. Antonio; besides several small islets. Of these isles the most considerable is St. Iago, the chief town of which is the seat of government. The population has been estimated at 42,000 persons.—Salt is the principal article of commerce.

We have already shown the usual courses and allowances to be made in sailing to these islands; and have there noticed the fogs by which they are frequently surrounded. The estimated limits of the N.E. trade-winds, in the vicinity, may be seen in pages 12 and 13*.

POSITIONS OF THE ISLANDS.

	Latitude N.			Longitude W.		
Sal, or Salt Island; North Point	16°	51′	0″	22°	58′	30″
South Point	16	34	0	23	0	0
Bonavista; N.W. Point	16	13	20	22	59	40
New Town	16	7	0	22	59	30
South Point	15	57	0	22	52	40
N.E. Point	16	11	0	22	46	30
Mayo; the North Point	15	19	30	23	16	0
English Road	15	7	30	23	17	0
South Point	15	6	40	23	14	0
Island of St. Iago; Bighurde or North Point	15	19	30	23	49	30
East Point	15	0	30	23	29	0
Porto Praya	15	53	40	23	34	0
S.W. Point	14	58	30	23	47	0
Island of Fogo; North Point	15	1	15	24	25	0
Town of Nossa Senhora da Luz	14	53	0	24	34	0
Brava; Road on the West side	14	48	0	24	47	30
St. Nicolas; East Point	16	34	30	24	3	0
North Point	16	42	0	24	24	20
West Point	16	38	0	24	30	0
South Point	16	28	30	24	22	0
Raza; East Point	16	38	0	24	38	30
Santa Lucia; East Point	16	46	0	24	45	0
North Point	16	49	0	24	50	30
St. Vincent; Porto Grande	16	54	0	25	4	0
St. Antonio; North Point	17	12	0	25	9	20
West Point	17	4	0	25	25	45
South Point	16	55	0	25	22	0
East Point	17	5	30	25	2	40

ILHA de SAL, or SALT ISLAND.—The Isle of Sal, lies between latitude 16° 34′ and 16° 51′. The meridian of 23° W. according to the late survey, passes through the middle of it. The northern part of the isle is mountainous; the southern very low and sandy. Both the eastern and western sides are irregular, and the former has an almost continued reef along shore, from North to South.

SAL derives its name from the salt-ponds upon it, wherein the water crystallizes into a beautiful salt, the chief production of the isle; as the land is so barren as to bear no trees, nor verdure, excepting a few inconsiderable shrubs.

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* Mr. Finlaison has said that, "In leaving Tenerife for the Cape Verde Islands, you will certainly have the wind from E. by S. to N.E. as you approach the islands." He also adds that, in the passage, a current was generally found setting *from S.S.W.* at the rate of half a mile an hour, which is contrary to the current on the African coast.

CAPTAIN OWEN has noticed that, in 1822, H.M.S. *Leven*, in shaping a course from Tenerife for the Cape Verde Islands, steered S.W. ½ W., being half a point more to the westward than the course should have been had the compass been uninfluenced by the local attraction of the ship, or "by what is called deviation [we say *aberration.*]" The *Barracouta*, at the same time, shaped hers without regard to this deviation, which in her was full one point on the S.W.: the consequence was, that she was carried considerably to the eastward of her direct course, which prevented her reaching Sal until two days after the arrival of the Leven. "This is mentioned," says Captain O., "to show the probability that many of the extraordinary currents said to be found in the ocean do not exist; or rather that the discrepancies between the observations and dead-reckoning may as frequently be attributed to the unthought-of deviation of the compass, as to other occult causes."

But, we are inclined to think that, in the instance cited, there must have been a *compound* error; due allowance not having been made either for current or aberration.

On approaching the island from the north, it will be found, in general, that the currents are very irregular. You may, on approaching, see the high land at 14 leagues off; sometimes at a greater distance. This land makes in three hillocks, of which the northernmost is the highest. This is the *Peak of Martinez*, in the N.E., the summit of which is 1340 feet above the level of the sea.

The best roadsteads of Sal are on the western side of the island; but there are three little bays on the eastern side, and one on the south. The middle bay on the eastern side, where a ship may lie, is apparently sheltered from the N.E. by a sandy reef stretching out to the eastward, and here salt may be obtained.* The other bays on this side are open to the N.E. trade-wind, which makes a very heavy sea on the beach.

Great caution is required on approaching the south end of the island in the night, it being so low as hardly to be seen at 10 miles off in the day. Keep your lead going, and approach no nearer than in 30 fathoms, unless bound into the *South Bay*, which lies between the S.E. and South points of the island.†

The S.E. point of Sal is now called *Wreck Point*, H.M. sloop *Erne* having been wrecked near it in 1819; this is surrounded by a reef. From *South Point*, forming the west side of the bay, a dangerous sandy spit extends about one mile into the sea. If coming into the bay, between these points, after rounding Wreck Point in 8 or 9 fathoms, bring that point to bear E. by S. and the opposite point W. ½ N., and anchor in 9 fathoms, sandy bottom. Here you will be sheltered from the N.E. trade, and lie in perfect safety.

At 5 miles to the west, from the *North Point* of Sal, is *Manuel* or the *N.W. Point*. Nearly true South, 8½ miles from the latter, is a little islet, called *Bird Isle*, near a promontory, *Lion's Head*, which is 620 feet high. At a league to the northward of Bird Isle, is a small bay, called *Palmyra Bay*, and immediately to the south-eastward of the Lion's Head, is *Mordeira Bay*, which is one of the best in the Cape Verde Islands.

MORDEIRA BAY is in a semi-circular shape, one league in extent between its outer point, *Lion's Head* and *Turtle Point*. It is a safe anchorage during the N.E. breezes. Captain Bartholomew says, that it has plenty of fish and turtle, but has no watering-place; nor could that article be procured by sinking casks in the sand.

H.M. ships *Leven* and *Barracouta* anchored in this bay in 1822, and caught a great many most delicious fish: yet the place produces little else than salt and orchilla; a few goats contrive to pick up a scanty subsistence, but eagles abound.

The principal mark for anchoring in Mordeira Bay is, Bird Island just shut in with the foot of Lion's Head, at a mile and a quarter from the bluff land; there are several foul spots; therefore the ground should be examined before the anchor be dropped.

From Turtle Point, the South Point of Mordeira Bay, to the South Point of Sal, the distance is one league and a half: the ground between is smooth, and has 7 fathoms over it, at half a mile from shore, which is sandy: but be careful, if you anchor, that the ground is clear. In rounding the South Point, with the spit extending from it, approach no nearer than in 10 or 8 fathoms, as the latter is steep.

The latitude of the Lion's Head, according to the late survey, is 16° 41′; longitude 23° 0′ 15″. *Variation*, observed on shore, 15° 20′ W. High water, 7*h.* 15*m.*, rise 5 feet.

Between Sal and Bonavista there is, generally, a strong current.

BONAVISTA.—The Island of Bonavista, properly *Boavista*, or *Good Sight*, has been so called from the beautiful appearance it made to the first discoverers, in the year 1450. The face of it is variegated; partly low, partly rocky and mountainous; formerly fertile, now more barren. Salt is the principal article of trade, which the inhabitants readily exchange for old clothes, biscuits, meal, and raw silk. The principal place is ENGLISH ROAD, on the N.W.

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* *Firestone Hill.*—A promontory on the eastern coast, stands at two leagues from the North Point. At the back of this is the Salt-pond Hill, a natural curiosity, as upon this is the salt pond, 150 feet above the level of the sea. The surface of the pond, in a circular form, 45 feet below the top of the hill.

† Hearkening for the noise of the surf will often give ample warning in approaching land, either during a fog or by night, and ought to be attended to if heard: but no one ought to run rashly, making certain of hearing it.—*A.L.*

The town consists of only forty or fifty houses, rudely constructed and mostly of negro architecture. The colour of the inhabitants is from white to negro jet, comprehending all the intermediate shades; and they are so intermarried, slaves excepted, that they may be considered as one family. The population of Bonavista, in 1822, was said to be about 3000, of whom 300 were regular soldiers. Pigs, goats, sheep, and poultry, may be had here, but all are lean, and of inferior quality.

The eastern side of Bonavista is partly environed by a reef; and, on the N.E. are the reefs on which the Hartwell, East-Indiaman, was lost, in 1787; and on which the Resolution, Captain Cook, was nearly driven by a southerly current. Half a league, nearly, from the west end is a coral reef, on which the sea breaks; and, at times, the current sets on it very rapidly.

From the south end of Sal, the N.W. point of Bonavista lies *true* South, or S. by W. ¼ W., by compass, distant seven leagues; and, from the same end of Sal, to clear the N.E. reefs, the course, by compass, is S.E. by S. 11 leagues, in order to allow for the current that sets to the S.W. on Bonavista: be sure to make this course, and it will bring you to the eastward of these reefs; the easternmost part of which lies in latitude 16° 10′.

Bonavista is of an irregular shape, but nearly octagonal, and each way three leagues in extent. Its eastern side is low, but the interior is mountainous, and a ridge of high land from N.W. to S.E. divides the island into two unequal parts. Of this inland chain *Mount Juan Fernandez* is the northern part, and the southern is called the *South Mountain.* Two miles from the N.E. end is another eminence, *Mount Ochel* or *Ochello:* at the N.W. end is the *Peak Reshee,* and in the S.W. is the *Platform Hill,* with an elevation within it, called the *Man Mountain. English Road,* on which the town is situate, forms a bay, 5 miles in extent from N.E. to S.W., and its northern part is protected by an islet called by the English *Small Island.* The south point of this bay is *Coral Point;* and off this point, which is foul, at the distance of half a league, is a coral reef.

Off the N.E. coast, as shown above, are the Hartwell Reefs, and three kays, called *Dutch, Braithwaite,* and *North, Kays.* Between these is sufficient depth of water for ships, in case of necessity, and proper depths for anchorage, under the lee of the reefs; but many rocks are here scattered, with only 12 or 13 feet over them, and 4 fathoms close along them, on which, with a wind, the sea breaks very high. Of the channels between these reefs, the best lies between a ledge to the E.S.E. of Braithwaite or the Middle Kay, which is always visible, and Dutch or the South Kay. This channel is three-quarters of a mile broad, and has regular soundings, from 15 to 5 fathoms; having been tried by H.M. sloop *Bull-dog,* which often sailed in and out of it, and several times anchored under Braithwaite Kay, with that Kay N.E. by E., Dutch Kay S. ½ W. You may moor at half a mile from Braithwaite Kay, in 6 or 7 fathoms, tolerably good ground.

Braithwaite Kay is about two miles from the shore. The passage to the north-westward, between this and North Kay, is half a mile broad, and its least water is 7 and 8 fathoms. The passage between Dutch Kay and Bonavista is narrow, but in the best water are 7 fathoms. Dutch Kay bears from Braithwaite Kay S. ½ W. [*S. by E.*] 2¼ miles.

The *North Kay* is connected to the shore by a reef, having over it only 5 feet of water. When this Kay is in a line with the summit of Mount Ochel, or the N.E. high mountain in Bonavista, it bears about W.S.W. ½ W.

In sailing out to the south-eastward, with the wind easterly, stand well to the southward, taking advantage of the current here setting easterly, and take care not to borrow too near the back of the reefs.*

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* **Madeline Reef.**—In latitude 16° 19′, at about 8 leagues *E.N.E. true* from the N.E. side of Bonavista, is a reef, lately reported as a new discovery, and on which the ship *Madeline,* bound to Sydney, struck and was wrecked in April, 1835. This rock was inserted in the chart of the Cape Verde Islands, published in 1809, but was afterward omitted on the report of Captain Bartholomew, who sought for it in 1819, and pronounced its *non-existence,* although he appears to have passed at a little to the northward of it. When the Madeline struck, two fathoms only were found under the main-chains, and the rudder and keel were instantly knocked away. The ship was hove by the sea into deep water, where no bottom was found; the well was sounded and 5 feet found in it; and, notwithstanding all exertions, she filled rapidly: when, having 10 feet in the hold, and the vessel settling fast, the commander and crew took to the boats, and the next evening reached Port Praya.

The breakers on the reef were subsequently seen by Captain Goldsmith, in the *Wave,* of London, September, 1836.

This shoal has been confounded with the *Bonetta Reef,* which lies at nearly 40 leagues eastward from Bonavista, as shown in the Memoir on the Atlantic, page 380, and which, also, appears to have been missed by Captain Bartholomew, whose routes were to the northward and westward of it.

The *Brazen Hill* and *Point*, (otherwise *Brazen Head*,) in latitude 16° 2′, on the S.E. coast, is the first high land to the southward of *East-sand Head*, which is the easternmost point of Bonavista. The Head is remarkable, being very bluff and perpendicular on each side. The beach is sandy. The *South Point*, which is nearly 3 leagues more to the south-eastward, is low and foul, and an islet, of the same description, lies at three-quarters of a mile to the eastward. To the westward of the point is anchorage, in what is called *Portuguese Road*, with the Platform Hill bearing about N.N.W. and nearer in shore, in from 13 and 14 to 8 and 6 fathoms. In the latter depths the landing-place will bear N.E. by N. more than a mile distant.*

North and West Coasts. From the *North Kay*, off Mount Ochell, already described, the coast is foul to *Broyal Point*, on the north coast; and there are several reefs between the latter and the N.W. end of the islands, which are called the *North Point and Reef*. Small Island, which forms the N.W. side of English Road, is 4 miles hence to the south-westward.

English Road is a safe anchorage during the summer months, while you have the N.E. breezes, but there are three reefs in it, as shown on the new charts. Vessels generally haul close round Small Island, in 6 and 7 fathoms, and pass within the first reef (of 10 feet) in order to avoid the necessity of making a tack to get to the anchorage. The best mark for the latter is, the town open with the N.E. end of Small Island, and the highest part of that isle about N. by E. The Ten-feet Reef generally shows itself, but when this is not the case, a stranger will do well to stand outside, rounding it at about 1½ or 2 miles from Small Island, approaching it no nearer than in 6 fathoms, and after once opening the town taking care not to shut it in again.

The new town is on the middle of the bay, and the second reef (*New Town Reef*,) lies to the westward of it, at a short distance from the beach. The *Inner Reef* lies, in like manner, half a league more to the northward. The Ten-feet Reef is about 100 fathoms in length, and extends nearly East and West, at rather more than a quarter of a mile from Small Island.

Mr. Keilor has said, "We experienced, in a calm, a very large sea, breaking in every part of the bay, and were, at the same time, riding with a very short scope of cable, by reason of a strong current setting out of the bay, against the sea: this current runs so high as to frequently break on the deck.

In the rainy season, which is during the months of July, August, and September, the Island of Bonavista is subject to light airs of changeable winds, with heavy swells in the bay and roadsteads.

The tide flows, in English Road, at half-past two, on full and change days, and the sea rises 5 feet. Observe that there is no fresh water for shipping at Bonavista. There is water, but not plenty of it, near the Portuguese Road.

LETON ROCK, or John Leton's Rock, a dangerous reef, lies in lat. 15° 48′, long. 23° 13′. This shoal has heretofore been variously represented, and described as just even with the surface of the sea, which breaks upon it with great violence. The bottom about it is rocky, and swarms with fish. Its extent from North to South is about a mile.

From the centre of the reef the North Point of Bonavista bears N.E. ½ N. [*N.* 26° *E.*] 9½ leagues, and the South of the same E. by N. [*N.* 64° *E.*] 7 leagues.

The lamentable wreck of the Lady Burgess, East-India ship, one of the outward-bound fleet of 1806, was caused by striking on the Leton Rock. This ship struck among the breakers on the rock, at two in the morning of the 19th of April, 1806. It appeared, from the observations subsequently made, that the Leton Reef is composed of coral; no part above water. Captain Swinton conjectured that the extent on which a ship would strike is not above a cable's length, and that there are no breakers on it in fine weather. To the northward it appeared to be steep-to.

This danger appears to be on the central part of an extensive bank of coral soundings, extending 4 or 5 miles to the southward, and considerably to the eastward and westward. Its situation, according to the late survey, is that given above.

ISLE OF MAYO.—This island is raised considerably above the sea, but a great part is level, excepting three inland mountains, of considerable height: but these show as hummocks, and are not conspicuous. On the S.W. side is a sandy bay, called **English Road**, within which is the town and extensive salt-pans. The soil of this isle is generally dry and unproductive, and there is but one spring of water in the island. The coast is, however, plentifully stocked with fish, which supply, with a few vegetable productions, subsistence to the poor inhabitants.

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* Mr. Finlaison says, that it is requisite to give the point under Platform Hill a good berth, as there is a reef extending three miles off. In the day you may see the sea breaking on it. The Mountain E.N.E. clears the danger.

From the S.W. end of Bonavista to the island of Mayo, the course is S.W. by S., distant 15 leagues; Mayo is about 4 leagues in length from North to South, rising most toward the middle. On approaching the island from the S.E. the appearance is very different; you may descry, in the north part, two hummocks, which appear like two islands; but, when nearer, the land is perceived, by which they are connected. Southward of these is a mountain, (*Monte Mayo,*) with very low ground to the south, over which two hillocks are seen.

At half a league from the middle of the north side of the island is a reef extending N.N.E. and S.S.W. three-quarters of a mile, which must be cautiously avoided.

In *English Road,* ships may anchor in 7 or 8 fathoms of water. The landing is very indifferent; no good water to be had; and the place is quite defenceless. The shore to the eastward of and abreast the town is steep, bluff, and rocky; but, to the westward, a low white sandy beach extends to a rounding point from which a spit of sand and coral stretches outward, at a short distance from the extremity of which there is no ground at 45 fathoms. The spit may be rounded in about 16 fathoms, and a ship should not anchor farther out than in that depth, the edge of the bank being steep. At half a mile west from the town there is anchorage in 12 fathoms, lat. according to *particular plan,* 15° 6′ 10″, long. 23° 15′. Variation on shore 15° 16′ W. 1819.*

ST. IAGO.—Ships running from Bonavista to St. Iago, and being obliged to ply to windward during the night, must be cautious how they approach Mayo, on account of the reef, before mentioned, off the north point of that island. Having doubled that point, they may steer S.W. to make the land of St. Iago, and thence southward until they make the Road of Praya, the common place of anchorage.

The land of St. Iago is very high, and the eastern coast is bordered with rocks, lying very near the land, along which you may sail very safely, at the distance of two miles. The S.E. part appears as a long low point, when you are to the northward or southward of it; and, from this point *S.W. by S. true,* about 6 miles, lies the east point of Porto Praya. Between the two, and near the former, lies a bay, which so much resembles that of Port Praya, that many vessels, deceived by the likeness, have run the hazard of being lost in this dangerous place: at the bottom of it are several cocoa-nut trees, and a few houses; the land between this and the point of Port Praya is mostly perpendicular, appearing, in some places, like the *Berry Head* in Torbay; and though the Fort of Port Praya, which stands on a small cliff, is a mark by which the true bay may be distinguished from the false one, yet the surest mark is, that the north or east point of the false bay is surrounded with breakers; whereas the point of Port Praya is high, steep, and free from shoals: you must haul close round the point, and keep within a cable's length of the shore to go to the anchoring-place. It may, also, be noticed that there is now a naval signal-post on the cliff, at half a league to the northward of the entrance of Port Praya.

PORT PRAYA is a fine bay, which lies between two points, bearing from each other *W. by S.* and *E. by N. true,* about 1½ mile. As you sail round the east point, you will soon open the forts at the bottom of the bay, to the westward of which, in a valley, are several cocoa-nut trees and a small house.

The winds, except in the tornado season, are generally in the N.E. quarter, and frequently blow fresh and squally; there are also frequent puffs from over the high land; therefore as you haul into the bay, it is necessary to have the top-gallant sails furled, and to take one reef or more in the topsails. The cliffs, from the east part of the fort, are those above described: you may easily sail within a cable's length of the east land, where you will have 7 or 8 fathoms of water, and, in many places, see the ground at that depth.

On the western side of the bay lies a small black island, called the *Isle of Quails,* or

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* For Captain Mudge's Remarks on the Magnetic influence of Mayo, see '*Atlantic Memoir,*' Note 2, page 32.

Frenchman's Island; it is almost even to the top, but rugged at each end, and some rocks lie off each end to about half a cable's length: there is also a rocky ledge off the north end, where the water is, in general, shallow: you will not have more than 3 fathoms of water between this and the fort; inside, or to the westward of the island, it is navigable for boats only.*

Captain Grant, in the relation of his voyage to New South Wales,† has stated that after rounding the S.E. point of St. Iago, there is a small bay to the East, about 4 miles, called by the inhabitants after St. Francis. This bay, he says, may be always known, by its having, at the back of it, and nearly close down to the water's edge, a high flat-topped table land, standing between two mountains, which cannot be mistaken. Port Praya has, at the bottom of it, beside the house already mentioned, a long low valley, running inland to a considerable extent, the mountains behind which are sharp and peaked. Near the landing-place there are two remarkable forts on the east side, which you must open before you come to anchor; and, on the west side, is Quail's Island, which is readily seen as you enter. But the surest mark is that, from the S.E. end of the island of St. Iago, the shore is low and rocky in general, until you reach the bay of St. Francis: thence to Port Praya the shore is of high clayey cliffs, which round into the harbour, forming the East side of it.

"Since the commencement of the last war, two forts have been erected, one of fourteen, the other of eleven, guns. They are both inclosed with a wall, kept in good order, and white-washed, which make a pleasing appearance. There are, also, several redoubts, with guns mounted in them, but in a ruinous state. The inhabitants are chiefly black, a few officers about the governor excepted. The troops appeared to be natives of the island, black, and poorly clothed. From the height that the forts and town stand on, a tolerable defence toward the sea might be made; but, if an enemy were landed, the island would instantly fall; particularly as it has few internal resources, and even water is brought from a well in the valley at the back of the town, the only place where they get water in the dry season, which could be cut off. At the time we were here, the ground was parched up, exhibiting a barren waste, scattered with pumice-stones and other volcanic matter."

It seldom rains here, but a dry haze is very prevalent. In December and January the wind is frequently far to the eastward, veering, at times, to the northward in the same season. In settled weather, there are often regular land and sea-breezes in the bay; the sea-breeze setting in near noon, with a great surf on the shore, and ending at four or five o'clock in the afternoon. The N.E. wind sets in toward evening, and continues during the night. As there is generally some surf on the beach, boats should lie at their grapnels; and the casks of water hoisted into them, after being filled at the well, and rolled down and floated through the surf. By sending a pump on shore to place in the well, ships may be sooner watered than if the water be drawn up by buckets; and some planks taken on shore will be useful to place under the casks, when rolling down either over stony uneven ground or soft sand.

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* St. Iago was visited by H.M. ship *Bustard*, in 1825, when the following remarks were written by the master, Mr. *Edw. Dunsterville*:—"This island, bearing W.N.W. ½ W., 8 leagues, appears very high. *Mount St. Antonio*, rising out of its centre, is of a conical form, and terminates in a peak, which peak, bearing N.N.W. (by compass) leads to Port Praya Road; and as you advance westward, you will see the East end, which is very low. As a farther guide, you will see an opening, several miles north-eastward of the harbour, on *Signal-post Hill*, which gradually slopes to the westward; also *Red Hill*, which is on the larboard side of the bay, N. by W.

"The town is situate on an eminence rather high, and perfectly white; the houses being visible from S. by E. to S.W. by W.

"In sailing into the bay, keep well to the eastward, as the ground to the westward is foul. Anchor in from 10 to 7 fathoms, with the Red Hill W. by N. Outer Eastern Entrance, E.S.E. Latitude of the anchorage 14° 53′ 10″.

"A heavy swell sets into the bay, and the prevailing winds are from N.E. to East. On the 22d of October the weather was sultry, with heavy rains. Fruit, cattle, and water, may be obtained here. The two latter not very good. The watering-place is at the back of the town, and at some distance from the beach. Small casks are the most convenient in foul weather: but otherwise you raft the casks off from the ship to the beach.

"Quail Island, though centrically situated, is too near the main-land to assist any one in finding the anchorage. Do not approach it, on any point, nearer than half a mile, as the vicinity is rocky, and some rocks do not appear above the surface. Saluted the Governor with thirteen guns, which were returned with an equal number, and every officer was treated with respect."

† Published by Mr. Egerton, London, 4to. 1803.

For sailing into Port Praya Bay, you may borrow on the eastern point (*Ponta das Bicudas*) to 7 or 8 fathoms of water, and thence proceed north-westward to the anchorage. It is to be noticed that the ground is foul in different parts, particularly on the western side.

The best anchorage is, to bring the flag-staff on the fort N.W. by N. [*N.W.*] about three-quarters of a mile, the body of Quail's Island West, and the point of the bay opposite Quail's Island, E. by S., in 7 and 8 fathoms. Many commanders prefer anchoring nearer the north-east side of the bay than the Isle of Quails, for the sake of more easily getting under sail, without running the risk of being carried by the currents upon the points of rocks to leeward, before the vessel has gained fresh way enough to steer clear of them; and it has been observed, that vessels may anchor any where in the bay, from 9 to 11 fathoms, good bottom, but nearer to the eastern shore than to the Isle of Quails: as the wind, except in the months of August, September, and October, generally blows from the N.E.

H.M. ship Tartar, Sir George Collier, anchored with the best bower in 11 fathoms, nearly in a line with, or a little within, the two outer points, ground of sand and bits of coral. Quail Island then bore N.W., the flag-staff of the fort N.N.W., and East point of the bay E. ½ S. A salute of thirteen guns was returned. Stock of all kinds was in great plenty.

"The Bay of Praya being under the south end of St. Iago, should you be to the leeward of it, you will find it difficult in beating to windward against so strong a current as there is here. In the months of July, August, and September, the rains are frequent, and the southerly winds, which then prevail, cause a great sea in the bay, with a great surf on shore. The inhabitants, in these months, are subject to dangerous fevers."

To the foregoing observations, the following, by an officer of the Argo, 1802, may, with propriety, be added:—There are two wells from which water is obtained; the farthest, on the west of the town, is the best, and the water good. The casks must be rolled up to the well and back again, which is the most tedious part of the business. The water is drawn from the well by buckets, sent on shore for that purpose, and a tail-block, made fast to a branch of a tree, which hangs over the well. The boats will sail on and off shore.

The sandy cove, on the east side of the bay, is an excellent place to haul the sean or seine in; as is, also, the head of the bay. The principal fish are the mullet, grey and red, rock-fish, snappers, cavalla, and a variety of small fish.

The governor-general of the Cape Verde Islands resided, formerly, at St. Iago, an episcopal city, and the capital of the island; but foreign ships having totally abandoned the road of St. Iago, which is very bad, and of difficult access, to come to that of Praya, the governor now resides at this bay during the dry season.

To those bound from Praya Bay to Bonavista, Mr. Keilor recommends that they should endeavour to sail in the evening, as the current will be favourable. He adds, do not stand too far over toward the African shore, nor work between Mayo and St. Iago, and you will find the ship get to the eastward very fast.

REMARKS *on* ST. IAGO, &c., *by Capt. J. W. Monteath*, 1824.

Nov. 20, 1824, at 4 h. 20 m. *p.m.* Mount Ochel, on the N.E. end of Bonavista, was indistinctly seen through the haze (which generally prevails among these islands) bearing N. 80° W.; the latitude (estimated by observation at noon) 16° 10′. The longitude by chronometers, at the same time, being 22° 8′ 30″ W. From this position we shaped our course so as to pass well to the eastward of the island Mayo, in case there should be any westerly current.

In running from Mayo toward St. Iago, I would advise vessels to steer directly for the most southerly point of the latter island; this will carry you about 4 miles clear of the S.E. point, which is low and rocky: between it and St. Francis Bay are a number of black patches of rocks, a considerable way inland, and which, at that distance, have the appearance of low bushy trees.

The *Bay of St. Francis* may easily be distinguished from that of *Port Praya*, from the west point of the former being high, while that of the latter, *Cape Tubaron*, is very low and rocky: it has, also, a fort with a flagstaff, which is distinctly seen before you open the Bay of Praya; this of itself is a sufficient mark for the harbour.

The beach in St. Francis Bay is sandy, and has a great number of palm-trees growing close to it; there are only two houses in the bay; the one on the western, and the other on the eastern, side. The flat, as mentioned by Captain Grant, is also a very good mark for this bay.

Nov. 21, at 3 *p. m.*, we rounded the East point of, and anchored in, *Praya Bay*, in 5 fathoms of water, black mud and sand, the eastern point of the bay bearing E.S.E.; fort at the town N.N.W. in a line with a high peaked mountain, and Point Tubaron in a line with the south end of Quail Island, S.W. by S. It is necessary to mention that, in anchoring, you should endeavour to shut in (or nearly so) Point Tubaron with the south end of Quail Island, as outside of this line the ground is very rocky, and you may have difficulty in purchasing your anchor.

After anchoring we pulled toward the landing place on the N.E. part of the bay, but were informed by a sentinel that we could not land until the visit was paid, which took place in about half an hour, with the usual Portuguese formalities; we were then informed that we were at liberty to land. You are not allowed to embark after sun-set without a pass.

The Island of St. Iago is high, mountainous, and rugged; it, however, contains many extensive valleys, affording good pasture for cattle, with which it formerly abounded; and, were it in the hands of any industrious nation, would be capable of very considerable improvement; although about Praya the water (except by wells) is scarce, yet, in the other parts of the island, as I was informed, it is well watered, and by irrigation might produce sugar, maize, and vegetables, in abundance: but, from the rapaciousness of the government, the people have no encouragement to improve their condition, which, at present, is miserably poor; as they are fleeced of every thing which can by any pretext be laid hold of. Cotton and indigo thrive well, the whole of the valleys and heights about the town being covered with these plants; but the people do not take any pains to cultivate them.

The town of Praya stands on a hill at the bottom of the bay, and consists of three streets extending in an East and West direction. The *Plaza* or Square is in the N.W. quarter of the town, and contains the custom-house, barracks, jail, and other public buildings. All the inhabitants, fit for service, are armed with pikes, and are drilled regularly every morning in the square, by the officers of the garrison. The fort, which faces the bay, mounts 40 pieces of cannon, principally 9 and 12 pounders, and which are in tolerably good order. The magazine and church stand on the western side of the fort. There are two other forts on the heights on the eastern side of the bay, which command the road, and would prove very serviceably, in case of an attack by sea.

The landing-place for goods is on the N.W. part of the bay, from which there is a road to the town; this road is, however, very steep, and all the goods are carried up the hill by negroes, which incurs a considerable expense to the owners. The well is situated in a valley at the back of the town, and is nearly half a mile from the landing-place: it was formerly kept very dirty, but the present governor has built a shed over it: there is also a crane, with eight buckets attached, and a guard placed to prevent any improper use of it. You may land the casks and fill them with your own people, but I should prefer getting this done by the natives, as the heat is very oppressive, and the sailors are so liable to get sick, owing to the heat and the facility with which they are supplied with the spirits of the country, which are wretchedly bad. The cost of a puncheon from the boat, filling at the well, and rolling back to the beach, is three-quarters of a dollar; small casks in proportion. I was informed that the governor intended to bring the water in pipes to the beach, and charge the above price; if so, it will greatly facilitate a vessel's watering, and save the casks very much.

In January, 1830, it was officially announced that the health-visit (the charge for which was formerly six dollars) was, by a royal decree, entirely and for ever abolished; and that, in lieu thereof, it is provided that if any ship-master desire a certificate that his vessel has been admitted to entry, he shall have the same on payment of one dollar. The Port-charges at Villa de Praya were, at the same time, reduced to less than ten dollars.

Fruit was, formerly, very abundant and cheap: as were cattle, goats and pigs.[*] There is an export duty of 15 per cent. on cattle, pigs, goats, and corn; turkeys and fowls at the town are, in general, scarce, but can be procured, from the interior of the island, in two or three days; these pay no export duty.

The greatest revenue arising from these islands to the crown of Portugal is obtained from the orchilla weed, and which is monopolized by the government. It is calculated to amount to £50,000 sterling annually.

The governor-general resides here during the dry season, but, on the approach of the rainy months, he removes to Bonavista. He is making considerable improvements at Villa de Praya, but is much hampered by want of money; the court of Lisbon sending out no returns in lieu of those sent from the islands.

The Fredish Americans have a consul here, and have considerable trade among the islands, which they supply with coarse India goods, tobacco, fish, lumber, butter, shoes, tea, and a variety of other articles, which they barter for hides, goat-skins, old copper, and camwood, which last is procured from Africa.

Through the polite attention of the British consul-general, who procured for us every thing we required, we were next day ready for sea; and to that gentleman and his lady we were much indebted during our stay for the attention and hospitality we received from them. At sun-set we got under way without difficulty, and proceeded on our voyage.

The latitude of the anchorage, by circle and sextant, was observed as 14° 53′ 57″, and the longitude, by mean of chronometers, as 23° 31′ 15′

FUEGO OR FOGO.—This island, much higher than any other of the Cape Verde Islands, is only a continued mountain, rising into a peak of great height, which burns continually. The height of this peak is 1626½ fathoms above the level of the sea. This island has, nevertheless, some inhabitants, whom the eruptions of the volcano force sometimes to quit the island. The ground is clear within a mile of the shore, on the N.W., West, and South, parts; but, on the S.E., East, and N.E. parts it is rocky. At about 4 miles from the north end of Fogo lies a rock, with 12 or 14 feet of water on it, over which the sea breaks when it blows hard, but not else, and the sea is clean all round it.[†]

The town is that of *Nossa Senhora da Luz*, or *Luz*, on the western side. The roadstead is open, and the anchoring ground off the town very close in, being only half a mile from the shore. In 25 fathoms, rocky bottom, the northern extremity bears N. 20° E. [*N.* 4° *W.*]; the southern extremity, S. 68° E.; the northern flagstaff N. 85° E. the southern, N. 21° E.

No other soundings are to be obtained near either Fogo or Brava with a line of 130 fathoms, at three-quarters of a mile from shore.

The marks, says Mr. Keilor, when a brig was at anchor off the town, in 10 fathoms of water, were, the town bearing E. by N., a quarter of a mile; the Mount, E.N.E.; the south end of Brava, S.E. by S. The bay is open, with foul ground, and a bad landing for boats.

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[*] But, in a dreadful mortality which prevailed among the cattle, in the month of March, 1828, the greater part is said to have perished.—ED.

The Salem Register, (American paper,) in October, 1832, gave the following melancholy details of a famine at these Islands:—"By the arrival at this port of the *Fredonia*, Captain Rider, in thirty days from Port Praya, we learn that a universal famine extends through the whole groupe of these once truly verdant islands. Three years have now elapsed since they have been visited with rains in any considerable quantities. The land, in the mean time, has become parched and unfit for cultivation, and has yielded little or nothing to repay the toil of the cultivator. The season for the crops of the present year has nearly gone by, and the seed remained in the earth without signs of coming to maturity, unless it should be speedily visited by copious rains. The trees and all kinds of vegetation are withering and passing away. Most of the animals in the islands have died from starvation, and those that remain are of no service to the inhabitants; they having strength hardly sufficient to sustain their famished bodies. It would be difficult to present to the reader an adequate idea of the horrid condition in which the inhabitants were placed when Captain Rider sailed. At every port at which he stopped the utmost misery existed among all classes." In the preceding month of April the island of Fogo was in a state of actual famine, and many of the inhabitants had perished from want of food. This is a serious specimen of the vicissitudes to which the islands are subjected.

[†] Not inserted in the Admiralty chart; its existence is, therefore, questionable.

BRAVA.—Brava is very high, and might be seen at a great distance, were it not constantly covered by a dense atmosphere. Its climate is temperate and healthy. The winds here prevail at N.E. or East most part of the year, excepting in July, August, and September. The channel between Fogo and Brava is nine leagues in breadth. Five miles to the N.N.E. of Brava are the *Rombos* or *Romes*, two small rocky isles, nearly connected by smaller rocks, forming a crescent. The westernmost isle is lofty and has a peak on it. Between these islets and the North end of Brava is a clear passage. Brava has heretofore had plenty of corn, live-stock, and fruit; but bad landing for boats, except in the harbour on the N.E.

Although Brava is very high, its mountains rising one above the other, like pyramids; yet, being so near the isle of Fogo, it seems, in comparison, to be but low. It produces plenty of salt, and abounds most with saltpetre of any of the islands. According to Captain Roberts, it has several bays or roads, where a ship may anchor, the best of which, called *Furna*, or the *Oven*, lies toward the north-east end of the island; if you haul in near the rock, which is a very good kay, having water enough by the side for a first-rate man-of-war, you will lie land-locked from all winds; nor does any wind blow in there, except from the S. by E. to the S.W., which heaves a sea into the bay, and makes it very well deserve the name of a harbour.

The natives of Brava are all blacks, and very few; you will find them the most harmless, hospitable, and generous, of all the islanders.

St. NICOLAS.—At this island vessels of different nations have occasionally touched for refreshments; which were sold at moderate prices. The land is high, and the coasts therefore subject to heavy squalls, &c.

There are two remarkable mountains, which may be seen from a distance of 15 leagues; one in the shape of a sugar-loaf, called the *Peak of Trade*, which is near the middle of the island, the other, *Monte Gordo*, near the west end.

From English Road, in Bonavista, to the East Point of St. Nicolas, the *true* bearing is W.N.W. and the distance 22 leagues: the course must be regulated according to the set of the sea. The east end of the island may be known by its being a platform point, having a pyramidal rock, which appears like a sail, at a short distance.

On the south side, at a league and a half from this end of the island, is a bay, having a black sandy beach and a pond of fresh water, supplied from the mountains, and hence called, by the English, *Freshwater Bay*. To anchor in this bay, shut all the land to the eastward within the east point of the bay; you will then lie in 7 fathoms of water, within half a mile from the shore. There is good landing for the boats, with plenty of good water in fine weather, and at neap-tides; for, as the tides rise here 5 or 6 feet on the new and full moon, the pond is then overflowed. At this time you are subject to heavy squalls; and, notwithstanding the wind blows off shore, the sea is very high close to the beach.

At about 4 leagues to the westward from the middle of Freshwater Bay, lies *St. George's Bay*, where a ship can get refreshments; but there is no water. This bay is known by a sugar-loaf mount, and a flag-staff on the hill above the bay: there is tolerable good anchoring in 7 fathoms, close to the shore; but, without that depth, or in 9 or 10 fathoms, the ground is rocky. There is a shelf stretching S.E. by S. from the N.E. point of the bay, on which less water is found than within it; so that, should your anchor start, which will happen if you are not careful, the bank being very steep, and the squalls very sudden, it may hook this shelf and be lost. The marks to anchor are, the cove, or landing-place for boats, N.W., distant a quarter of a mile; Sugar-loaf Mount N.E. by E., and the flag-staff N.W. by N.

On the S.W. side of St. Nicolas is *Terrafal Bay*, where you may anchor in from 20 to 10 fathoms, with the coast to the southward bearing S. by E. and the Islands Raza and Branco in a line bearing N.W. by W. ¼ W. [*W.N.W. ½ W.*] and the landing-place E. ½ N. a quarter of a mile.

The Custom-house is situate on the S.E. angle or corner of this bay. From this to the West point of St. Nicolas there is a bank of soundings, with from 40 to 20 and 35 fathoms at half a mile from shore. In the last depth is anchorage, in sandy ground, at a mile S. by W. from the West point, but sheltered only from the N.E.

There is, in Terrafal Bay, a high bluff rocky point, near a quarter of a mile short of the sea-side; in which place it is low, stony, gravelly, and, in some places, shingly ground; the shore being a pebbly beach. On each side of this point is a very deep gully, out of which come violent flaws or gusts of wind; and, therefore, when any thing of a hard gale blows, it is very difficult to turn up into this bay. To avoid these flaws, you must anchor right against the point, between the gullies, where you may ride very easy under its lee, in from 16 to 3 fathoms.

Within this Bay the depths are 12, 13, and 14 fathoms, soft ground; and then they shoalen gradually to the shore, to the depths of 4 or 5 fathoms, where you have again sand to the pebbly beach.

By digging a well, almost any where on the low land, you may water here, unless the rainy season has failed; but there is always water in the valley, about half a mile from the sea, whence the natives will bring it down on asses for a trifle. From this road you may see, in clear weather, all the leeward islands; but if it be in the least hazy, the Isle Raza is not discernible.

RAZA, BRANCO, and ST. LUCIA.—These islands lie between those of St. Nicholas and St. Vincent, as shown on the charts. RAZA lies *true* West 8 miles from the West Point of St. Nicholas, and appears in the old charts under the name of *Chaon* or *Dog's Isle.* It is nearly two miles long, from East to West, and 1½ broad. The landing-place is under the N.W. point facing the West. This island is low and uninhabited. The edge of its coast is steep and rocky, and landing is difficult when there is any wind. Between it and Branco, at about one-third from Raza, is a coral reef, extending S.S.W. and N.N.E., and having on its shallow part 6 fathoms of water, but deepening gradually on the west to 15, and on the east to 18 and 20 fathoms. The sea continually breaks over the reef, owing to a strong tide or current setting through between the isles.

BRANCO, the Redonda of the old charts, is a league to the N.W. of Raza, and much higher. In the passage between are soundings of 6 to 18 in the middle, and, decreasing near Branco, to 7, fathoms. The latter is a narrow island, 2½ miles long from S.E. to N.W. A long spit of sand stretches from its S.E. end, on which the rollers or break is violent, and its shore is altogether rocky.

Praya Branco, on the N.W. side of the island, has a small village of about thirty stone-built houses, thatched with reeds. The scenery here, being on the side of a stupendous mountain, is picturesque and magnificent; a small stream of water supplies the village; bananas and papayas are planted on the borders of the brook; cassada and vines on the banks of the valley; the latter grounds are so laid that they can be irrigated; for which purpose the soil is supported on its different levels by stone walls, about three feet high. Sugar canes are cultivated in small quantities. The bread is made from maize or Indian corn, and from farina, or flour of Cassava. The natives are in general poor, but very courteous.

Monte Gordo, or the Broad Mountain, is in the central part of the island, toward the west. Its summit is 4200 feet above the level of the sea. The mountain is composed entirely of volcanic matter, very fragile and porous, and does not form a peak like many of the smaller ones on the island. It is well clothed with vegetation, even to the summit. The *Euphorbium balsamifera* flourishes to about 3700 feet above the level of the sea. The prospect hence is very extensive, calm, and beautiful. *Mr. Forbes; Captain Owen,* Vol. I. page 27.

ST. LUCIA lies at the distance of 3½ miles to the northward of Branco, and the Bank of soundings extends to this island. The bank here forms a regular flat of 10 to 13 fathoms. The south coast trends nearly East and West 4 miles, and in the middle of it is a good landing-place. A steep bank, half a mile broad, stretches from it, having on its edge 2 to 4 fathoms. The N.W. part of St. Lucia rises into high mountains.

Captain Bartholomew describes St. Lucia as of moderate height, with a bay on the S.W., where small vessels may anchor; being sheltered from all points but South and S.E. The beach is sandy; the anchorage, small pebbles and sand. In the middle of the bay is an islet, named *Leon,* with the ruins of a village on it, and frequented by fishermen only. There are many turtle here, and much orchilla is gathered, with some cotton, in a wild state.

These islets are occasionally visited by parties from the other islands, for the purpose of hunting wild bullocks and goats.

ST. VINCENT'S.—The island of St. Vincent is separated by a clear channel, 4 miles broad, from that of St. Lucia, and by one of 7 miles from that of St. Antonio. This island is 11 miles long, from East to West, and about 6 broad. It has two chains of mountains, facing the N.E. and S.W., which form a central valley that terminates in the bay called *Porto Grande,* upon the N.W. side of the island. The N.E. coast forms two bays, separated by a low peninsula, of two miles on either side, and this coast has been described as altogether dangerous.

Porto Grande is the largest and best bay in the Cape Verde Islands: it is capable of holding 300 sail of large ships, well sheltered under the high lands, and has a fine appearance. *Lieuts.* (since *Captains*) *Vidal* and *Mudge,* who surveyed this place, in 1820, say of it, that it forms a good and safe anchorage, where you may strip and refit your ship; as it is sheltered both from wind and sea. The wind generally blows from the N.E. over a part of the land, and seaward it is protected by the island of St. Antonio.

Wood is plentiful, and water may be obtained from the well, on the eastern shore,—but it is not good, and is scarce in the dry season. After a refit here a complete supply of the latter may be found in the Bay of Terrafal, St. Antonio, which is 6 leagues to the westward, and reckoned the best watering-place among the Cape Verde Islands. Cattle may be had at Porto-Grande, but they are not good. The church and custom-house are situate in the bottom of the bay on the east, and a signal-post may be seen, erected upon a hill, at a short distance from the anchorage, which gives notice of whatever may be passing or approaching the island.*

Latitude of the Custom-House, 16° 53′ 33″, long. 25° 3′ 19″. Variation, 17° 46′, 1820.

Without the entrance of the bay, at nearly three-quarters of a mile from its N.W. point, is a remarkable steep islet, called *Bird Isle,* which, at a distance, appears round like a sugar-loaf. *Mr. Finlaison* says, you may run in on either side of it, and will find regular soundings thence to the shore; depths from 30 to 10, 8, 6, 4, and 2, fathoms, to the beach. The ground is good, in most parts of the bay, and you may anchor any where in 7 or 6 fathoms of water, sandy bottom, with coral branches. The water is very clear, so that you may pick out a clear spot for the anchor.

"Ships should moor with a kedge, as a very strong current commonly sets to the N.E. between Bird Island and the shore: and, as the N.E. wind is variable, at night it is impossible to keep a clear anchor, without this precaution; for the wind, at times, comes in strong gusts from off the land."†

Mr. Finlaison adds, "In running between St. Antonio and St. Vincent, we sounded in 42 fathoms, bits of coral mixed with sand and small stones. Within half a mile of Bird Island we had 42 fathoms.

"Having proceeded about 8 miles to the southward of St. Vincent's, 40 fathoms of water were found; and, on approaching *Still Bay,* at the S.W. side of the island, found regular soundings, oaze and sand, to 20 fathoms, nearly in the centre of that bay. We anchored in this depth, with the West Point of the Bay, W. by N. and its East Point E.S.E. The distance between the two Points is 2½ miles; regular soundings from the ship to the shore, and very good landing on the beach. The ground is perfectly clear of rocks, but the bay is open to the S.W. wind. Water is also to be got by digging for."

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* March 30, 1822.—" On the *Leven's* arrival in Porto Grande, we sent on shore to a few houses called a town, at the bottom of the bay, to inform the governor who we were and what were our wishes. We could find only one miserable Portuguese, the rest being all negroes; but most of them appeared to be free. The whole population did not exceed 100, without any plantations near their houses, as the soil is so very dry and steril; but, on the sides of the mountains, in parts where there is water, they are said to have some good gardens. Indigo grows everywhere wild; and with it they dye the coarse cloths which they manufacture from cotton, which, if ever planted by them, appears to be left entirely to Nature's cultivation and care.

"We pitched a tent upon the beach; cleaned a well in a ravine, which, during the rainy season, is a water-course; then landed the women and a party to wash. During our stay, the sea-breeze every day blew furiously over the hills to the N.E. of our anchorage; and, although the whole bay is nearly land-locked, yet the surf is very high all round, except in one spot near the town. We, therefore, embarked only a tun and a half of bad water, and caught a few fish."—*Capt. W. F. Owen,* Vol. I. 28.

† In working between St. Antonio and St. Vincent, to Porto-Grande, you may stand to a mile off St. Antonio, and as near as you please to St. Vincent, as the current generally sets strongly through to the N.E.—*R. Keilor.*

Mr. Finlaison says, that ships bound through this channel, should keep over toward the latter, as no danger whatever is to be apprehended on that side.

Captain Bartholomew describes the bay on the S.W. side as the *Bay of S. Pedro*, having a fine sandy beach, and he says that vessels may anchor in 10 fathoms, near the middle of the bay, or rather more to the westward. The anchorage is good in the dry season, and the inhabitants say there is plenty of wood and water. The American whalers frequent this place.

On the eastern side of the island is another anchorage, the *Praya da Gatta*, with a sandy beach, near which vessels may anchor in 6 fathoms; the bottom is clear, but a sea sets directly in when the wind is either N.E. or S.E., the island of Sta. Lucia sheltering between these points. This bay and coast are without wood, water, and inhabitants.

ST. ANTONIO.—This island, as already shown, lies at the distance of 8 miles to the N.W. of St. Vincent, and it appears, altogether, like an assemblage of high mountains, particularly to the west. It is 22 miles in length, from East to West, and about 11 in breadth, and its highest peak is estimated at 9,700 feet above the level of the sea.

Of the two highest mountains in the west, the *Sugar-loaf* is the most elevated, and both are commonly covered with clouds. According to the late survey, the Sugar-loaf stands in 17° 4′ N. and 25° 20½′ W. The island is very woody, but has plenty of goats, fruits, and salt; it produces wine, cotton, indigo, &c. There is a village, *Santa Cruz*, on its S.E. side, but the ground is not fit for anchorage.

Terrafal Bay, which is only half a league to the northward of the S.W. end of the island, has been already noticed (page 54) as the best watering-place in the Cape Verde Islands, and other refreshments may here be purchased. The edge of the bank, with 40 fathoms, is about one-third of a mile from shore. At a cable's length within are 30 fathoms, and it thence shoalens inward to 20, 8, and 4, fathoms: the latter near the beach. Latitude of the Landing and Watering Place, 16° 57′; Long. 25° 24′ 48″. Variation, in 1820, 16° W.

"This watering place of Terrafal Bay is one of the most convenient for the purpose amongst the Cape Verde Islands. The bay is spacious, and has a black sandy bottom. Vessels anchor in 20 fathoms, at three quarters of a cable's length from the shore, sheltered from the N.E. and South winds and sea: and when the wind comes to the westward of South or North, there is always, from the extreme high land, a calm in the bay, the wind never blowing home, but only occasioning a swell to set in.

"From the high mountains over the Bay a small stream descends, which is never dry: on the first level spot a large pond has been formed as a reservoir to receive the stream, with a sluice to conduct it to the sands between the flat and the beach, which is a gradual descent; the flat may be about 60 or 70 feet above the level of the sea, and is generally moist and cool. In the vicinity of the pool is a fine plantation of bananas, papayas, &c., and in the lower sandy grounds a cotton plantation, with some trees of the *asclepias procera*. Just above the beach is a well: and, when the water is let off from the pool, all the soil between it and the well must be saturated before any can arrive at the latter. The reservoir, it appears, was formed with a view to water the plantation only, but the crews of the small trading vessels which take off the Orchilla moss dug the well below, rather than have the trouble of going to the pool. Three huts are used as Orchilla stores for *Mr. Martinez*, who farms that weed.

"The negroes, at first, mistook our vessels for privateers, and would not, therefore, assist us in obtaining water. We were, consequently, obliged to employ our own people to keep it turned into the pool, and to open the sluice to obtain our supplies, which were completed in the course of a day, and the next morning we sailed for St. Iago.

"In going out of the bay the wind was light, and we warped out by sending a stream-anchor ahead, with two hawsers on end, where it was thrown overboard, the boat having had a depth of 35 fathoms the instant before; but it appeared to have fallen over a precipitous cliff, similar to that which lined the beach half a mile within it; for the anchor would have carried out cable, seemingly, as long as we would have veered it, and the boat could get no soundings with 60 fathoms: the consequence was, that the hawser was cut through at 30 or 40 from the anchor, and lost.

"We inferred from this that the superstructure of this volcanic island was quite similar to that below the surface of the water: in short, that it was but the summit of an immense mountain, whose base may be as far below the surface as if it were an iceberg. As the highest mountain of St. Antonio is 8000 feet high, and as the mean height of the island may be taken at 1500, the base may be three or four miles deep. But as these speculations constituted no part of the object of our voyage, we made the best of our way to Porto Praya, and were caught between the islands with a calm and thunder squalls."—*Captain Owen*, vol. i. 30.

Of St. ANTONIO, Captain Monteath has said, "This island, the north-westermost of the Cape Verdes, is high; and may easily be descried, in clear weather, at the distance of 18 leagues; by distances between the nearer limbs of the ☉ and ☽, 27th Feb. 1818, taken when the S.W. point bore N. by E. ½ E., distant 25 miles, I made the longitude 25° 35′ 45″ W.; and, by chronometer, 25° 30′; the mean of which places the S.W. end of the island in 25° 25′ W. From the atmosphere being hazy in the horizon, I was prevented from ascertaining the true bearing of the S.W. point at the time of observation; but, from bearings taken previous, with the ship's run corrected, I am inclined to believe 25° 25′ W. to be nearly the true longitude, and not 25° 35′, as had been previously stated."

After passing St. Antonio, as above, Captain Monteath, between the parallels of three and two degrees North, found the current to set S.E. by E. in the twenty-four hours; but, between 4° and 14° S., the ship was set, by the Equatorial Current, 80 miles westerly in five days.

Captain Monteath adds, "*On approaching St. Antonio*, which is very high, and may be discerned in clear weather at a great distance, it appears black, rocky, and barren; consisting of immense rocks or mountains, heaped on each other, and rising far above the clouds, which, in general, cover a great portion of their summits. On the N.E. part of the island the mountains are divided by deep ravines and gullies, which have every appearance of deep water having passed down them: on rounding the N.E. point you will perceive, to the S.W., large white patches from near the shore, until about half-way up the mountains; at this distance they are not unlike ripe fields of corn; but, on nearing them, they are found to consist only of large white rocks, like pumice, and are entirely destitute of verdure; the mountains toward the centre of the island are composed of rocks of stratified basalt, in thick and perpendicular columns, to their very summits: it also rises more gently, for a considerable elevation, than either the N.E. or N.W. ends, but without verdure, excepting a few tufts of brush-wood near the shore and patches of brown heath, with which the island is generally covered. From the N.E. point, until rounding the point of Sta. Cruz, the only habitations I could discern were two or three miserable-looking huts built upon the shore, about a mile distant from each other.

"After rounding the point on which the town of Sta. Cruz is laid down on the charts, I kept a good look-out, expecting the fort or town to open to view: but was surprised at not seeing any appearance of either. However, after a minute search with the spy-glass, I did observe a few negro-huts among a quantity of brush-wood, in a small valley near the shore, and in which there appeared to be a little verdure; this was, in fact, the only place which I observed green in any part of the south side of this miserable island; and this, I suppose, must be the town of Sta. Cruz.

"The S.W. point is pretty well covered with brush-wood, but I saw no signs of cultivation nor inhabitants. The channel between this island and St. Vincent's is quite clear of danger, and within a short distance of the shore on each side (except off the point of Sta. Cruz, where the breakers run out about a mile) is bold-to, and I should apprehend that a vessel might work through this passage with little risk, either by day or night."

5.—SHOALS, &c. between the CAPE VERDE ISLES and the N.E. COAST of BRASIL.

These shoals, &c., described more fully in the Memoir on the Atlantic Ocean and the Directory for the Ethiopic Ocean, are as follow:—

The VIGIA of FIVE PALMAS, in latitude 12° N., longitude 27° 20′ W., described also as *Hinman's Shoal*. Position and even existence very doubtful.

Patty's Overfalls,—lat. 11° N., long. 24° 30′ W. Seen by Captain Springall, in the brig Patty, 1820, when the sea was so agitated as to break on deck.

Hannah's Coral Shoal,—lat. 10° 7′ N., and long. 27° 32′ W., discovered by Capt. Thos. Fanning, 25th June, 1824. It appeared to extend 150 fathoms N.E. and S.W. Weed was seen on the surface of the water, and the reef seemed very dangerous. Longitude not exactly ascertained.

Longchamp's Rock,—lat. 9° 47′, long. 30°. Not known to modern navigators, and its existence is very doubtful.

Warley's Shoal,— lat. 5° 4′ N., long. 21° 25′ W., said to have been passed over, in about 7 fathoms of water, by the *Warley*, East-Indiaman, in 1813. Since sought for by Captain Geo. Cheveley, but not found.

French Shoal,—lat. 4° 5′ N., long. 20° 35′ W. Vaguely described, but said to have been seen by several ships. The **Cæsar's Breakers**, lat. 2° N., and long. 22° 18′ W., are now supposed to be merely imaginary.

Crown Reef.—On the 9th of February, 1835, the bark *Crown*, of Liverpool, after crossing the Equator, with a pleasant breeze at E.S.E. and running at the rate of 6½ knots, at three-quarters past 10, *p.m.* touched the ground and grated for a short time with the keel, as if passing over a coral reef; so soon as clear, the boat was lowered down, but no bottom was found at the depth of 120 fathoms. The latitude of the spot was 57 minutes south, and the mean longitude, by chronometers and lunars, 23° 19′ W. For further particulars, see the *Nautical Magazine*, October, 1835, page 577.

Aquila Reef.—At about 140 miles eastward from the Crown is the *Aquila Reef, if existing.* On the 12th of April, 1831, the *Aquila*, of Scarboro, Capt. John Taylor, was in latitude 0° 22′ 15″ S. and longitude 21° 6′ 30″ W., light winds and fine pleasant weather. At 40 minutes *p.m.* the water being very smooth, and the ship going at the rate of five knots, a loud rumbling noise was heard under her bottom, and a sensation felt exactly like that of a vessel sliding over a rock: the rudder was so much agitated, that the man who was steering could scarcely hold the wheel. No difference could be observed in the colour of the water, nor the smallest rippling. The captain concluded, at first, it must have been a rock; but after arriving in London, there was not, on examination, the least sign of any rub on the copper; and it was concluded that there must have been, in the spot above-mentioned, a volcanic eruption, the shock of which did not exceed 15 seconds. The situation of the Aquila, as shown in the Table, was very near that of the *Silhouette* in 1754, which experienced a similar shock, as shown in the Directory for the Ethiopic Ocean, page 71.

Krusenstern's Volcano.—On the 19th of May, 1806, at five in the evening, "we saw," says Admiral Krusenstern, "in lat. 2° 43′ S. and long. 20° 35′ W., in the direction of N.N.W., and at the distance of about twelve or fifteen miles, a singular phenomenon; but which, owing to the lateness of the day, we were unable to examine sufficiently close to ascertain the nature of it. A cloud of smoke arose to about the height of a ship's mast; disappeared suddenly; then arose again, and vanished entirely. It could not be a waterspout, nor a ship on fire, as some persons on board conceived, for the smoke rose much too high; and Dr. Horner was of opinion that, if the whole was not an ocular deception, occasioned by a peculiar refraction of the rays of light, it had all the appearance of a volcanic eruption, and was, possibly, the forerunner of an island."

We have not the least doubt of its being a volcanic eruption; and notice it as having probably left, at least, a shoal on the spot. Such may, also, have been the origin of other shoals, now no more. Its true longitude is probably 20° 44′ W.

TRITON'S BANK.—Captain Proudfoot, in the ship *Triton*, from Calcutta to Gibraltar, passed over a shoal on the 18th of December, 1816, in lat. 0° 32′ S. and longitude 17° 37′ W., by mean of two chronometers, adjusted at St. Helena to Captain Horsburgh's longitude. [This, corrected, will be about 17° 44′.] It appeared to extend in an East and West direction, three miles; and in a north and south direction, one mile. Sounded in 23 fathoms, brown sand: saw no appearance of breakers.

PEÑEDO DE SAN PEDRO, *lat.* 0° 55′ N., *long.* 29° 15′ W. This groupe of rocks is described in our Memoir on the Atlantic, seventh edition, p. 381. To that description the following may be added.

First, *Commodore Brou*, of the French frigate *Hermione*, in 1825, describes Peñedo de

San Pedro as a mile in extent, in a N.E. and S.W. direction; seen in fine weather four to five leagues off; when bearing N.W. appearing in the form of three pinnacles of sharp naked rocks of a remarkable shape. The S.W. pinnacle separated a short distance from the others. The latter appears safe to approach, and no breakers were seen, to indicate sunken rocks. The Hermione sailed round on the eastern side, at the distance of 5 miles; did not try for soundings; but from the colour of the water it was presumed that bottom would not be found.

The Equatorial Current set the ship to the westward at the mean rate of 18 miles, and to the north six miles, in the 24 hours, between the parallel of 8° N. and the Equator, and the meridians of 28° and 30° W. At the islets, the direction of the current changed and set more to the northward at three-quarters of a mile in the hour.

The Commodore gives the position as 0° 51′ N. and 29° 23′ W. We conclude that this is wrong. Captain Forster gave it as 0° 56′ N., and 29° 15′ 12″. We, therefore, continue our original statement, as given in the Memoir on the Atlantic.

The best description of these isles is that of Captain Amasa Delano, who, in the American ship *Perseverance,* from Boston toward Cape Horn, 23d Dec. 1799, at 2 *p.m.* saw three small islands bearing W. by S. two or three leagues distant. The vessel bore away, and at 3 *p.m.* was abreast of them. Hoisted the small boat out, went on shore, and found them to be nothing more than a cluster of craggy rocks, about one-fourth of a mile in extent from North to South, and nearly as much from East to West. No sort of vegetation existed upon them. The rocks were found to be five in number, but only two of any considerable magnitude. Their greatest extent was from N.N.E. to S.S.W. The two largest nearly connect with each other, and form a kind of harbour, or place of shelter, for a boat, on the N.W. side. Here they managed to land, but obtained nothing excepting a number of boobies. On shore the aspect was most dreary; the sea roaring and surging on all sides. Two smaller rocks were lying off to the S.S.W. of the large ones, and one, very small, to the N.E. When on the highest part, which was at least 100 feet above the surface of the sea, no dangers could be seen but what showed themselves above water; nor could any be discovered from the ship. Plenty of fish were caught in the harbour, or basin. At 6 *p.m.* returned on board. Sharks were numerous about the ship; but, in attempting to take them, a number of hooks and lines were lost, and several pair of grains broken. On sounding, within two miles of the islets, no ground could be found with a line of 200 fathoms.

Capt. Delano states that the islets may be seen at the distance of four leagues, and always make like three sail when first seen. They are very dangerous if fallen in with by night. The current near them set N.W. by N. true, one mile an hour. The parts above the reach of the surf are covered with birds' dung. The birds were hatching their young at the time. The month of November would be the season for procuring eggs at this place, as they may be obtained at that time in abundance; but, being the eggs of oceanic birds, they are rather fishy than sweet.

6.—FERNANDO NORONHA *and the* Roccas.

FERNANDO [Fernaõ] NORONHA.—The position of Fernando Noronha was ormerly given as 3° 56′ 20″ S. and 32° 38′ W., from Mr. Wales's chronometric observations, 9th June, 1775. Captain Cook reckoned it as 3° 53′ S. and 32° 24′ W. Captain Hewett, in 1817, gave it as 3° 54′ S. and 32° 31′ W.; but, from Captain Foster's observations, revised by Dr. Tiarks, the peak or pyramid is given as in 3° 50′ 10″ S., and 32° 23′ 45″.

This island is remarkable by a high rocky peak on its north side, called the *Pyramid,* very barren and rugged; and by its S.W. point, named the *Hole in the Wall,* which is pierced through, and gives a free passage to the sea. The Pyramid appears, at a distance, like a very high steeple or tower. The south side is distinguishable by a little rocky isle, that appears like a statue. The island is about seven miles long, and two or two and a quarter broad. It has been the rendezvous of vessels employed in the southern whale fishery, &c. for procuring supplies of cattle, sheep, poultry, wood, &c.; but water is frequently scarce.—East-India ships have, also, occasionally touched here, when they have been horsed to the westward by the currents.*

On approaching the island, no soundings will be found until very close in. There is no danger but what may be seen, excepting a rocky spot off the south side, between two and three miles from shore, and a rock at about a quarter of a mile from the S.W. point.

The road or principal anchorage is on the north side of the island, being sheltered by the north-eastern land, and several islets in that direction. The anchorage has from ten to twelve fathoms, loose sandy ground, at about half a mile from the citadel-point, or nearest shore. It is unsafe to lie in with northerly or N.W. winds, which are said to prevail from December to April; in the other months the winds are mostly from the S.E. or easterly; sometimes at N.E.

Water may be obtained here; but, in the dry season, it is sometimes very scarce. In seasons of drought, which are not uncommon, the rivulets are dried up, and the vegetation parched. There are but few vegetables, but plenty of live-stock and fish, with an immense quantity of doves. The fresh water is obtained from a well near the governor's house, in the cove called WATER-BAY; but the cask must be rolled over some rocks, and swung off to the boat, over the impeding surf.

Wood is cut on the larger islet to the N.E., called WOODING or RAT ISLAND. This islet is nearly surrounded by rocks, and there is a risk of staving the boat when taking off the wood, as it is heavy, and sinks if thrown into the water. Should the governor permit wood to be cut on the main island, it may be conveyed without much danger, from the fine sandy bays to the westward of the road.

On the 9th of April, 1827, H. M. Ship *Cambridge*, Captain T. J. Maling, touched here, and there were, at the time, about 200 inhabitants upon the island: of these 60 were soldiers, under the government of a Prussian officer, who, with the assistance of an Engineer, was repairing the fortifications and erecting new points of defence.

From Tobacco-Point, or the south point of the island, a reef of rocks, even with the water, extends half a mile to the southward; and to the S.E. by E., two and a half miles from the same point, is the centre of a rocky patch, on which the sea always breaks. When in a line with these rocks, the pyramid is shut in with the highest hill on the south side of the island. Between this reef and the shore, is a channel of from ten to fifteen fathoms.

The current here commonly sets strongly to the westward, for which due allowance must be made in rounding the islands on the N.E.

On the 6th of June, 1830, Captain Foster, in H. M. Ship *Chanticleer*, bade adieu to Ascension, and in six days came to an anchor off the village in the *Peak Bay* of Fernando Noronha.

Fernando Noronha has been copiously and finely described by Mr. Webster. The large island, he says, is still used by the Brasilians as a place of transportation for criminals, as well as for the exile of political delinquents. The beautiful scenery of this island is enchanting. The shore is scooped out by inlets, and embossed with green promontories, which are connected by circling beaches, where rippling waves chase each other over the silvery sands, and bathe the flowerets of the skirting woods. A fresh luxuriant verdure crown the summits of the hills, blending its soft hue with the general contour of the island. A richness and variety of vegetation is seen every where, excepting on the colossal pyramid of naked rock, which, rising from the bosom of a grove, stands erect in barren ruggedness, towering majestically over the smiling and fruitful scenes around. It is a gigantic block, the summit being 800 feet above the level of the sea, and is an excellent mark for seamen.

The scenery throughout is all fertility and beauty. There are no romantic hills and dales, but every thing is on a moderate scale, and pleasing to the eye. The vegetation is that of a thickly wooded grove, rather than that of the dense forest, for it admits of a walk even through its most shaded parts. There is an inland lake in the island, and one or two trifling brooks, but no permanent streams of any importance. In the wet seasons the island is one continued swamp and bog; while in the summer it is dry and arid, and occasionally altogether deficient of water.

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* A survey of the Island, on a large scale, with appearances of the land, &c., is published by Mr. Laurie.

Few of the trees are of sufficient magnitude to afford timber for many useful purposes, rarely exceeding 6 or 7 inches in diameter, and the largest a foot. The most common is the dark and laurelled *Bara*, which abounds with an acrid, caustic, milky juice, very much dreaded by the wood-cutters, as it produces inflammation of the skin and severe ophthalmia. This tree is, therefore, regarded as a nuisance, inasmuch as it acts as a powerful depilatory; it removes the hair from the horses and cows, and gives them a diseased appearance.

The soil is a fine rich loam, of a considerable depth, and has a reddish tinge. There is upland pasture for sheep, and rich plains for cultivation, besides little fairy vales, blooming in all the beauty of verdure. The sandy beaches in the sandy bays are sweetly picturesque, especially in the evening; the sand is as smooth as a well-rolled path, and the gentle ripple of the waves scarcely disturbs the tranquillity which reigns around.

The island is garrisoned by a small party of Brasilian soldiers, under the command of a major, who fills the office of governor. He has a few staff officers, and about 100 men. The islands are protected by several forts, which, if in good condition and well manned, would present a formidable mean of defence.

A small village is seated on the shore of Peak Bay, built in the form of a square. The houses composing it are not worthy of note, but are sufficient for the place. A neat chapel stands on the hill over the village, which also boasts a clean and comfortable hospital, and a respectable and commodious house for the governor. The other principal buildings consist of a set of barracks for the soldiers, a tank or large cistern for water, a bath, and a prison in which the culprits are safely lodged every night, after being allowed the liberty of ranging about the island by day. Most of the houses have gardens attached to them, and the governor has a farm at a short distance from the village, from whence his table is supplied.

At about a league from the village, in a S.E. direction toward Tobacco Bay, are extensive fields of Indian corn and cotton, besides a plantation of cocoa-nuts and a tolerable garden. A brick and tile manufactory is also carried on there, but there are no lime-kilns.

The employment of the people consists principally in fishing, for which purpose they have a manufactory of cotton line. Agriculture is much neglected, the greater part of the island being in a state of nature; but such is the richness of the soil that it would repay them well for any trouble they would bestow on it.

The process of drawing the seine is very interesting. This consists of a few long stems of a creeping convolvulus with the leaves on it, which are twisted together into a kind of mass or lump. Thus prepared, it is dragged into the water just within the break of the surf; and, when a fish is seen within the scope of their leafy net, they drag it quickly ashore, with the view of entangling it among the leaves. This device is sometimes very successful. The cotton hand-nets that they also use are very neatly constructed, and with these they reap a much richer harvest. Whilst the operation of drawing the seine is going forward on the beach, some are occupied in angling from the rocks of the projecting points, and among them sufficient fish is caught for the provision of all the islanders. Groupes of naked fellows may be seen seated on the beach watching the operations of the fishermen; while the pelican is diving continually about the edge of the surf, and the man-of-war bird over him, who, as the pelican rises with his prey, darts down on him with incredible rapidity, and makes him instantly disgorge it, when it is instantly seized by this second plunderer.

The attempts of these islanders at navigation are confined to the Catamaran, not a single boat being found throughout the whole island. All ideas of improvement on any thing are foreign to their minds; the accoutrements of their horses are the same as those used more than a century back; and, as for agriculture, they have no idea of it. The ground lies untilled before them, the earth smiles in vain, while they are ever lolling in their hammocks, smoking and gaming throughout the day, the very patterns of indolence and laziness. The evenings are passed in serenading to the notes of a guitar, or singing and revelling at some lascivious fandango. The only art for which Fernando is famous is that of rearing capons, which are of the finest description.

The island is supplied with flour and other provisions from Brasil; but the supplies are, at times, deficient. When the *Chanticleer* was here, in 1830, the governor was very glad to exchange his fresh beef for flour and biscuits. The cattle of the island are very fine, and an abundant supply of good young beef was obtained. The governor was exceedingly attentive, and sent off every morning sufficient milk for the men as well as officers. Vegetables were rather scarce, although they might be raised in any quantity. Rat Island yields a profusion of fine melons. The water melons are particularly so, and sometimes two feet long.

The climate of these isles has been described in page 6. For a description of the phenomenon called the *Rollers*, see the 'Directory for the Ethiopic Ocean,' pages 30 and 395.

During the stay of the Chanticleer, from the 12th of June to the 18th of July, the officers were kindly accommodated and most hospitably entertained by the governor and several families on the island.

THE **ROCCAS.**—These are dangerous low kays, in latitude 3° 55′ S., lying to the westward of Fernando Noronha, and on which the Britannia, East-India ship, and King George, transport, deceived by the currents, were lost in 1805. The kays, or islets, are sandy, with shrubs upon them; they cannot be seen from the mast-head, in the clearest weather, at the distance of more than three leagues. At their N.E. end is a high rock, and the sea breaks exceedingly high all round them. The ship *Glory*, at two miles to the west of the reefs, found bottom at twenty-eight fathoms, coral-rock. The current here was found to set two and a half miles hourly to the westward. Rise and fall of tide six feet.

Those approaching the Coast when to the westward of Fernando Noronha, must cautiously avoid the *Roccas*, and make all due allowance for the Equatorial or Westerly Current.

The longitude of the Roccas, lying near the parallel of Fernando Noronha, does not appear to be ascertained. In the given description of them, they are stated to lie 16 or 17 leagues to the westward of the island, or in about long. 33° 17′ W. The Portuguese, and Captain Birch, of the *Britannia*, have reported them as at only 15 leagues, while M. Roussin states that they have been given at 25 leagues;* but, upon the whole, we presume that the longitude 33° 30′, the mean of observations made in ten ships, as quoted by Captain Horsburgh, is not, westward, far from the truth. Captain Birch has said, that the rocks most dangerous are to the North and N.E., and the whole extent may be about five miles.

SECTION III.

THE NORTHERN COAST *of* BRASIL, *from* CAPE ST. ROQUE WESTWARD; *including* ARACATI, CIARA *or* SEARA, TUTOYA, MARANHAM, *and* PARA.

1.—GENERAL REMARKS *on the* NORTHERN COAST *of* BRASIL, *and on proceeding thereto.*

THE COAST.—*Cape St. Roque* is a headland in latitude 5° 28′ 17″ S., and 35° 17′ W. nine leagues to the S.S.E. of *Point Toiro* or *Calcanhar*, the N.E. point of Brasil. The cape, *so called*, is merely a down of sand, like the coast which precedes it to the south, and follows it to the north. The sand is uniformly white, and over it are several clusters of bushes. It may be known by several small *red cliffs;* but these show only when the sun is in a favourable direction; there may, however, be seen, a little to the south, several large trees, near the coast: and their wholly disappearing may form a guide for proceeding northward.

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* "*Pilote du Brésil,*" pages 37, 167. This we consider as erroneous.

The cape is not a salient point, though frequently so marked in the charts; nor does the land to the northward of it exhibit any remarkable change in appearance.

Northward of Cape St. Roque the coast gradually falls, or declines in height, to the distance of eight miles, where it forms the low point *Petetinga;* here the shore on the north forms a low bay. The point is not more remarkable than Cape St. Roque, and is to be ascertained, at a distance, by the difference of latitude only. The coast between the two is wholely of sand-downs, on which may be discovered scattered bushes of a dark green colour; and there are, here and there, some large trees, in round masses, but not definable as marks on approaching the shore. The extremity of Point Petetinga is given by the Baron Roussin as in latitude 5° 21′ 35″ S. and longitude 35° 19′ 23″.

Point Toiro or *Çalcanhar,* the summit of which is represented in lat. 5° 8′ 20″ S. and long. 35° 30′ 33″, is situate at the distance of six leagues N.N.W. ½ W. [*N.W. by N.*] from Point Petetinga, and the coast continues of the same nature with that which has been described, being low and sandy.

From Cape St. Roque to Point Toiro the shore is bordered by the *Recife,* or that remarkable ridge of coral rock, which characterizes the coast in general, as shown in the charts.* The more elevated part of this reef, within the present extent, is called *Pedras de Garca,* about 8 miles to the northward of Point Petetinga, and near which there is good anchorage.

BANKS of ST. ROQUE.—The FLATS or BANKS of ST. ROQUE are on a great extent of Shoal ground which encompasses all the N.E. coast of Brasil. They commence at Cape St. Roque in the south, and terminate beyond Point Tubaraõ or Tuberon in the N.W., in an extent of 34 leagues.

The northern edge of these banks lies in latitude 4° 51′ S. The longitude of the N.E. part (8 *fathoms*) is 35° 25′, and of the western, (6 *fathoms,*) 36° 36′.

There is a channel between the shore and the banks, which is known and used by the coasters. There are also passages between the dangerous spots on the banks, but they cannot be attempted by strangers. From the outer edge of the bank, the coast, although low, may generally be seen, in clear weather, at from 10 to 12 miles off.

The more shallow parts of the bank are distinguished, generally, by breakers. Of these the easternmost is a little to the west, and about 12 miles from *Point Toiro;* but its breakers are rarely seen. The second lies to the west, near and under the meridian of 36°, off a point called *Tres Irmaos,* or *Three Brothers.* This is named the *Lavandeira,* and occupies a great extent from East to West. The third and westernmost is a groupe of rocks called the *Urcas,* in longitude 36° 18′. The breakers on the Lavandeira and Urcas are very heavy at all times, but particularly when the wind blows from the offing toward shore. The Bank or *Paracel* of St. Roque, with 6 or 7 fathoms, terminates at about six leagues west from the Urcas.

On advancing to the edge of the Banks soundings of light sand will be found, with an admixture of broken coral, and a sudden discolouration of the water from its oceanic blue to a green colour. Hereabout the tide rises from 6 to 8 feet.

THE COAST RESUMED.—*Beyond Point Toiro,* or the great elbow of land to the northward of Cape St. Roque, the coast, extending W.N.W., is generally low, and has few distinguishing objects. To the south-eastward of Seara [Ciara,] or longitude about 38½°, there are, however, many inland and beautiful hills, and the coast is bordered with that remarkable ridge or reef of coral rock, which has been described. This reef, with frequent breaks, continues along shore nineteen leagues to the north-westward of Seara; and within this extent the land is moderately high; but it declines thence westward, and presents a low shore, with sand-downs, some of which are very little above the surface of the sea. The latter will be given in detail hereafter. The soundings, as they generally are off such coasts, are mostly regular, and decrease gradually toward the shore, from a distance of 4 or 5 leagues.

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* This belt or chain of coral rock more particularly distinguishes the Eastern coast, but it may also be traced on the Northern, nearly all the way to Maranham; and M. Roussin says that it seems as if its object were to defend the shore from the impetuosity of the waves, by which it is constantly assailed.

The reef, in several instances, is so exactly straight and even, as to seem the work of art, and rising like a wall from the bottom of the sea. In some places it is always covered; in others it is level with the sea at high water, and particular spots are from 6 to 10 feet above it. Its cuts or openings form the entrances to most of the creeks and harbours, as will be shown hereafter.

There will be no difficulty in navigating the coast, if proper attention and caution be exercised. A strict mast-head look-out should be kept; the lead should be constantly going; you should be distrustful of your distance from the land, both by day and night; and, be acquainted with the tides.

The Winds and Seasons of Brasil have been described in pages 1 to 6. For the tides, see pages 6 and 7. For the Currents, pages 9, 10, 11.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Cape San Roque; the summit of the Cliff	5	28	17	35	17	12
Point Petetinga; the base	5	21	35	35	19	23
Point Gamalera; the Down	5	12	24	35	29	55
Point Toiro or Calcanhar; the N.E. extremity of Brasil: summit	5	8	20	35	30	33
Lavandeira Breaker	4	54	40	36	2	8
Breakers on the Urcas	4	51	32	36	36	28
Point Tubaraõ: North Down	5	1	49	36	28	3
Point do Mel	4	55	17	36	59	8
Morro Tibaõ	4	49	20	37	17	43
Reteiro Pequeno; remarkable hummock	4	48	16	37	9	5
Reteiro Grande; hummock on the point	4	36	20	37	32	48
Morro of Aracati (*an inland hill*)	3	42	10	37	54	3
Mouth of the Jaguaripe; red bluff and battery	4	23	30	37	49	2
Point Macoripe	3	41	50	38	30	44
Ciara, otherwise Ceara or Seara; steeple	3	42	58	38	33	51
Hills of Ciara or Seara, as seen on the Meridian; 1st Summit	3	39	27	38	48	8
Morro of Opicem	3	33	30	38	49	12
Curú; the village	3	30	0	38	53	2
Hummock on Down of Parati	3	24	10	38	59	18
Hummock or Moudahu Point	3	10	0	39	17	25
Morro or Mount Melançias	3	11	40	39	19	24
Pernambuquinho	3	1	50	39	37	21
Rio dos Patos; the entrance	2	58	50	39	39	56
Mount Meruoca; the summit	3	17	55	40	5	24
Point of Jericoácoará; highest land	2	47	28	40	27	18
Hummock near the shore	2	50	22	40	39	18
Moro Ticondiba; the summit	3	10	37	40	36	38
Rio Camucim or Camosin; Hummock at the Entrance	2	50	0	40	44	58
Mount Tapuya; the Western summit	2	58	25	40	50	32
Rio Tapuya; entrance	2	50	25	40	50	13
Rio Iguarassu; entrance; East point	2	52	27	41	18	5
Hummock on a sandy isle	2	48	57	41	42	44
Rio das Perguiças, or Perjuizas; Eastern point	2	41	27	42	27	4
Lançoes Grandes; Eastern point	2	26	12	42	59	54
Hummock in the Lançoes Grandes	2	24	12	43	5	20
Another Hummock in the same	2	23	22	43	9	1
Morro Alegre	2	20	17	43	13	7
St. Anna's Breakers; Eastern point	2	12	38	43	29	32
St. Anna's Lighthouse (*a square tower: light revolving*)	2	16	18	43	41	22
Breakers of the Coroa Grande:						
Middle of the Northern	2	10	50	43	57	34
———— N.W.	2	13	15	44	3	59
———— West	2	17	0	44	5	9
Maranham Island; white down on the North side	2	24	36	44	4	11
Fort St. Marcos; flagstaff	2	28	22	44	15	56

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Fort St. Antonio das Areias; flagstaff	2	29	24	44	16	49
St. Luis de Maranham; steeple of the Cathedral	2	30	44	44	16	2
Point de Bom Fim: house	2	30	42	44	16	59
Point de Guia; red house	2	30	43	44	18	34
Point Ataki, or Taqui; Western extremity	2	33	4	44	20	25
Rock East of the Isle Medo	2	30	19	44	19	18
Alcantara; Western steeple	2	23	33	44	23	0
Point Tatinga, or Alcantara; the cliff	2	23	38	44	21	14
Point Janauba; red cliffy shore	2	22	4	44	20	17
Point Piraremo; middle of the cliff	2	19	26	44	19	26
Mount Alegre; the summit	2	17	16	44	19	58
Point Carnaveros	2	12	7	44	20	54
Monte Itacolomi, or Itacolumi; the summit	2	8	38	44	24	26
Shoal of Manoel Luis; Western rock	0	51	25	44	14	37
Anchorage of La Bayadère, before the same	0	52	3	44	14	50
Vigia, seen by M. Sylva, of the Brasilian Marine	0	32	0	44	17	14
St. Joaõ, or St. John's Island; N.E. extremity	1	14	30	44	52	0
Mount Guarapi	0	41	0	45	57	0
Salinas, or Salina; the pilot's station	0	33	0	47	15	0
Point Tigioca	0	32	0	47	46	0
Para, or Belim, on the Rio Para	1	21	0	48	28	15
Cape Magoary [*uncertain, but about*]	0	12	0	48	20	0

2.—PARTICULAR DESCRIPTION AND SAILING DIRECTIONS.

Under the meridian of 37° is the *Point do Mel,* a broad headland, bordered with the *Recife,* and dividing two spacious bays on the East and the West. The extreme points of these are, *Point Tubarao,* at ten leagues to the E.S.E., and the *Morro Tibao* or *Little Reteiro,* at six leagues to the W.N.W. The bank of soundings here extends to 4 or 5 leagues from shore, and near its edge, at 11 miles N.N.W. ½ W. from Point do Mel, lie the rocks called the *Angerstein Reef,* which will be presently described.

ARACATI.—The first port of the Northern Coast of Brasil is that of Aracati; on the *River Jaguaripe,* a place of rising consequence. The mouth of the river, as shown in the preceding Table, is in latitude 4° 23½′ S. and longitude 37° 49′ W. The river, from its bar to the town, was surveyed in 1829, by Mr. *Rd. Dixon,* commander of the *Westmoreland,* of Liverpool, who obligingly transmitted to us, in the next year, his original draft, on a scale of four inches to a mile, with a copy of the directions, which follow hereafter.[*]

Upon the south bank of the *Jaguaripe,* at the distance of about eleven miles from the entrance, is the town of Aracati. At the entrance is a bar, narrow and dangerous, owing to sand-banks on each side; and upon these the surf is very violent. The sand is so loose at the mouth of the river, that, even with the coasting vessels of the country, every precaution is required. The river widens immediately within the bar, and forms rather a spacious basin; but the port cannot, from the uncertainty of its depth, ever become important, and it has, at times, been nearly choked up.[†]

The Town of Aracati, a place of considerable trade, consists chiefly of one long street, extending east and west, with several minor streets branching from it to the southward. Thus far the river is influenced by the tide. At the ebb the stream is fordable; and, as it spreads considerably from the main channel, some parts remain quite dry at low water. The houses of Aracati, unlike those of any of the villages in the vicinity, have one story above the ground-floor, and this because the floods are sometimes so great as to render it necessary occasionally to retreat to the upper part of the houses. The town has three churches, a town-hall, a prison, and about 600 inhabitants.

The following are the Remarks and Directions written by Mr. Dixon.—" As vessels frequently engage at *Pernambuco*, on the eastern coast, to load a cargo, or part of a cargo, at Aracati: they consequently proceed, in the first instance, to the N.N.E., and then North, until they have passed Cape S. Roque and the parallel of the extensive Flats, on the north coast, bearing the same name. The latitude of the *Urcas*, the most dangerous reef on these flats, is 4° 50′ S. in the longitude of 36° 18′. Having passed these shoals, by running westward, in latitude 4° 40′ or thereabout, on approaching near enough to the shore, *Point do Mel* will be seen, composed of red cliffs and low white spots of sand on each side of them.* This point must be avoided, for when it bore about S.S.E., at the distance of seven miles, we were on a shallow bank of 17 feet, and farther to the leeward the water appeared white, and, without doubt, was shallower. Running along shore north-westward, and keeping in about 6 fathoms, Point *Reteiro Pequeno*, formerly called Cape *Corso*, will be seen, and also a mountain, appearing *blue*, in the interior; the former appears red, being a large bank of red sand, and the latter resembles Bardsey Island, in St. George's Channel. When these two objects are in one, the *Reteiro Grande* or *Algeberana Head* will be distinctly seen. The land to the south-eastward of this head, for 3 or 4 miles, has a very singular appearance, forming like two steps, the lower part being reddish, and the other grey. The head itself is rugged, and has a pinnacle close to its base, which, when bearing W. by S., will appear open.†

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[*] A reduction of the chart has since been published by the Admiralty.

[†] Koster's Travels in Brasil, vol. i. p. 175.

At the distance of about a mile there are several rocks, of which, the outermost is covered at high water; it is necessary, therefore, to give this head a good berth, until a large lump or hill, situated on the S.W. side of *Reteiro Bay*, is brought to bear S.W.: then steer toward the hill until Reteiro Head bears E.S.E. With these bearings there is safe anchorage in 3 fathoms of water; or, if the vessel's draught will admit, you may go farther in, and have smoother water, as the rocks off the head break off much of the sea.

Here vessels bound to Aracati generally lie at anchor, while the master proceeds thither over land to inform his consignee of his arrival, draught of water, &c. There is a house at the bottom of the bay, for the accommodation of travellers, and farther up the valley are some others, where a horse and guide may be procured. The distance from this place to Aracati is about 21 English miles, and a great part of the way is along the seashore. The course from this anchorage to the bar of the Jaguaripe is about N.W. ½ N.; the distance 20 miles.

The land in the vicinity of the Bar is very barren: on the north side of the entrance is a high red bluff, and also two rocks close to the water's edge: one of these has the appearance of a large gun mounted, with a small fort and flag-staff, and some huts close to it. These objects, together with the spit of sand on the S.E. side, the breakers across the mouth of the river, and the smoothness of the water within them, are good marks by which the entrance may be readily known.

In proceeding toward the Bar, a low spit of sand will be observed, which forms the S.E. side of the entrance of the river, and a ridge of heavy breakers, parallel to the shore for 2 or 3 miles, without any appearance of a passage. We approached them in our boat, and, perceiving a buoy, we soon got within the breakers, where we ascertained that this was not the channel used by the pilots, although there were 6 feet of water in it at low water. The *best channel* is farther to the N.W., for, besides having 3 feet at low water, it affords an easier passage out, as it lies in a N.E. and S.W. direction; whereas the former lies nearly E.N.E. and W.S.W. and is very narrow.

Both of these channels are liable to shift, and therefore every master ought to make himself acquainted with the state of the bar before he attempts to enter. Buoys or boats may be readily placed in the channel, or perches may be fixed on the spits, or on shore. He should also know the time of high water, and take the bar half an hour earlier.* After passing the boat or buoy that should be moored in the deepest water between the breakers, it will be necessary to haul up S.S.E. or South, to clear a bank on the west side, that nearly dries at low water. (On this bank, as well as on that to the north-eastward of it, perches ought to be fixed.) So soon as this bank is cleared, the depth will increase, and a westerly course must be taken, in order to pass between the high sandy beach on the starboard, and a low bank that dries at two hours ebb, on the larboard, hand. This channel, not a furlong in width, is by the pilots generally called the *Funnel;* and there are usually ten or twelve perches along the edge of the low bank. Having passed this narrow channel, it is proper to haul to the southward, to get under the sandy point on the south side of the river, into smooth water. In advancing toward *O'Neil's Bank,* which must be approached with caution, keep the lead going, and tack in good time, in order to get close to the weather shore. The channel between this bank and the shore is deep and narrow, but after passing it, there is good anchorage in 3½ or 4 fathoms, where vessels generally anchor when waiting for a wind or tide to go out.

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* The position of Point do Mel, as shown in the preceding Table, is lat. 4° 55′, long. 36° 59′.

† ANGERSTEIN REEF.—In the month of December, 1830, the brig *Angerstein*, John Bouch, master, passed through a cluster of rocks, thirteen in number, and from 2 to 3 fathoms under water. The vessel ran close alongside of one, which was quite visible under the water, and the master, heaving the lead on it, had not more than 11 feet of water. They are not dangerous by day, but may be by night, with a sea on. Mr. Bouch describes the rocks as of a dark brown colour, showing themselves sufficiently for a vessel to pass clear of them; and, before a second cast can be got, you may be in 10 fathoms of water. "They lie in a triangular form, about 11 miles from the land, with Ponto do Mel S.S.E. ½ E., and the Red Mount on the Reteiro W.N.W. ½ W., about 8 leagues."

In the original notice of this danger the latitude was mis-stated as 4° 28′ S. but the longitude *correctly*, as 37° 6′. With the given bearings, and distance from land, the latitude must be 4° 44′ or 4° 45′. Like the *Urcas*, at 15 leagues to the eastward of them, they seem to lie on the edge of the Flats, where there is a depth of 6 fathoms, with corally ground.

A vessel whose draught of water does not exceed 10 feet (and it would be imprudent to be much deeper for passing the bar) may sail up it at two hours' flood, to *Cook's anchorage,* where vessels generally load; and by waiting for more of flood she may go 2½ miles still farther up, and take in a cargo safely.

Sailing out of this port is more dangerous than coming in, as the wind is only favorable for passing the bar during three hours in the morning, and even then it cannot be depended upon. Should it fail, or head in the least, the vessel would be in imminent danger, as a heavy sea is always running on the bar; and the channel is so narrow, that anchoring would be useless. When a vessel has been conducted through the *Funnel,* and as far down as the lowest perch, and being on the starboard tack, as much canvas should be set as she can carry, in order to give her good way over the shallowest part and through the breakers.

No vessel should attempt to go out if it has been blowing hard the day before, as a heavy sea will then be on the bar, and probably the breeze not regular.

According to the pilots and inhabitants of the place, the channels often shift: the banks being composed of quick-sands, the river, when swollen with rains, forces its way through them in various directions, and sometimes forms new channels, so that there is no certainty of their being long in one position. It is also affirmed, that the channel is seldom deep enough till after the river has been raised by continued rain; and that in the dry season vessels may be detained for months from want of sufficient water.

The Tide and Current have been already noticed. See pages 7 and 9.

COAST between POINT TOIRO and ARACATI.—As there appears to be no modern detail of the coast between Point Toiro and Aracati, we give the following from the old hydrographer *Pimentel,* as it may still be acceptable.

The point *Tres Irmaos* of the late charts is the *Ponta das Pedras* of the old. Off this point Pimentel says, there are three shoals of rock, having a channel between them and the main, of 3 and 4 fathoms. At three leagues outward are reefs above water. (The *Lavandeira.)*

" Of the *River Guamará* [Aguamarea] to the S.W., the distinguishing marks are two inland sugar-loaf mountains, of unequal heights. To the west is the island [point] *Tubarao;* then follow the rivers *Amargosa, Cavallos,* and *Conchas:* of these rivers the first two lead to the Salinas or salt-ponds of Assu, whence many parts of Brasil have been supplied. The coast hence trends N.W. to the PONTA DO MEL, or Honey Point, as shown on the chart: the point may be known by its high red cliffs.

At the RIVER UPANEMA, [*Mossocro?*] situate as shown on the chart, are natural salinas, which, like those of Assu, require no artificial means for crystalization. Here the land is very level; and, on the west of the river, there are, as far as a field-piece can carry, red cliffs. Within land is *Monte Vermelhos*, [*Mt. Vibao?*] a sugar-loaf hill. Ships, however, should not advance into the bay, as it is full of shallows.

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* If a pilot be on board, care should be taken that, from his ignorance of the English language, he does not confuse the helmsman; a single mistake might prove fatal.

From the River Upanema to the N.W., the next river of any consequence is the IAGUARIPE, which may be known by a round bare hill of sand, on the N.W., terminating in a rock below, and within land a mountain, having seven sugar-loaf points.

Five leagues inland from the Iaguaripe, rises the range of the GUMAMÉ MOUNTAINS, which extend ten leagues in the direction of East and West.

Commencing at about three leagues from the River Iaguaripe, the land for nearly four leagues, close to the sea, appears dark and full, with several openings close to the bays. At about half a league from the commencement of these openings are some white cliffs, in shape like a schooner, with all sails set, and head at East. So soon as this full land terminates, the coast assumes a more flat and level appearance.

IAGUARIPE to SEARA.—*From the mouth of the Iaguaripe to Point Macoripe,* on the east of Ciara, or Seara, the coast trends *N.W. true,* (Variation 3° W.) and the distance is twenty leagues. The shore is uniformly sandy, but bordered by that remarkable reef which has been already noticed, having many breaks and an interval between it and the sandy shore; but inland are the several mountainous ranges, named *Monte Cascavela, Monte Canaveiros, Massaranguape, &c.* PIMENTEL describes a bay, IGUAPE, at about five leagues to the south-eastward of Seara, which now appears to have a village on it, and which he says, forms a small harbour to the westward of some low level land. The bay is surrounded by very high perpendicular cliffs, against which the sea breaks at half-tide. It has a high round rock, behind or within which is shelter and anchorage in 2½ or 3 fathoms. On the N.W. of this bluff rock you may anchor in the very roll of the sea, as it has 4 and 5 fathoms; and, on the strand, are pits for watering.

SEARA is the most important town upon this part of the coast. The bay on which it stands is formed by POINT MACORIPE (in latitude 3° 41′ 30″ S., and longitude 38° 30′ W.) to the eastward, and by the River Papina to the westward, an extent of about three leagues. It is extremely open; its greatest depth being three miles.

Abreast of the town, and at the distance of half a mile from the shore, extends a ridge of rocks, level with the water's edge, and within which small craft generally anchor, the entrance to the anchorage being around the eastern end of the reef.

The land within POINT MACORIPE is a high and irregular sand-hill, terminating in a point, which has a battery and tower near the extremity. Ships advancing from the N.E. should not approach the point nearer than two miles, and should choose a berth without the points which form the bay. His Majesty's ship *Inconstant*, in 1814, was the first English ship of war that had anchored here within the memory of the oldest inhabitants; having brought up in a spot which had previously been occupied by the American frigate *Constitution*.

Mr. Henry-Koster, in the Narrative of his Travels in Brasil, has given the following description of Seara, &c.

SEARA.—The *Villa da Fortaleza do Seara Grande*, or town of the fortress of Seara, is built upon heavy sand, in the form of a square, with four streets leading from it, and it has an additional long street on the north side of the square, which extends in a parallel direction, but is unconnected with it. The dwellings have a ground-floor only, and the streets are not paved; but some of the houses have foot-paths of brick in front. It contains three churches, the governor's palace, the town-hall and prison, a custom-house, and the treasury. The inhabitants are computed at about 1200. The fort, from which the place derives its name, stands upon a sand-hill close to the town, and consists of a sand or earth rampart toward the sea, and of stakes driven into the ground on the land-side. It has about half a dozen ill-arranged guns. The powder-magazine is situated upon another part of the sand-hill, in full view of the harbour. There is not much to invite the preference given to this spot; it has no river, nor any harbour, and the beach is bad to land upon: the breakers are violent, and the *recife*, or reef, affords very little protection to vessels riding at anchor within it. The settlement was formerly situated three leagues more to the north-westward, upon a narrow creek, (*Papina,*) where there now exists only the ruins of an old fort. The beach is steep, which renders the surf dangerous for a boat to pass through in making for the shore, and landing is particularly inconvenient. The anchoring ground is bad and exposed; the winds are always from the southward and eastward; if they were very variable, a vessel could scarcely ride upon the coast.

The public buildings at Seara are small and low, but neat and white-washed, and adapted to the purposes intended.

The *recife* or reef forms a complete ridge, at a considerable distance from the shore, and is to be seen at low water. It extends parallel with the shore for about one quarter of a mile, with two openings, one above and the other below the town. A small vessel may come to anchor between it and the shore; but a ship can bring up only in one of the openings of the ridge, or on the outside of it. A vessel coming in from the northward should make *Point Macoripe*, which is 2¼ miles to the eastward of the town, with a small fort on it, and may thence bring up in 6 or 5 fathoms. On the appearance of a ship, the town-fort displays a white flag upon a tall flag-staff.

Northward of Seara, about a mile from shore, is a rock, called *Pedra da Velha*, or the *Old Woman's Rock*, which may be known by the breakers over it. Within this, at half the distance, is another, called *Lobvendo;* and next, that portion of the recife within which and the beach small vessels may anchor. Eastward of the latter are three other rocky patches, of which the last is three-quarters of a mile to the west of Point Macoripe; and between this and the point is anchorage, under the latter, in 5 fathoms.

The *Inner Anchorage*, above-mentioned, is between the recife or reef and the shore. You enter by the eastern channel and go out by the western, when you cannot fetch out by the eastern one. Here a vessel lies at low water, surrounded by breakers, except in the channels; and, as the pilots are very inattentive, it is, altogether, very dangerous. This is, nevertheless, becoming a place of very considerable trade.

The Baron Roussin, in his '*Pilote du Brésil*,' makes the following remarks on Seara. Ciara * is the capital of the province of the same name. Its anchorage cannot be considered as a harbour, being exposed to all winds between N.W. and East, which are frequent hereabout; but the ground is excellent for holding, from three miles off the land to the reef which includes the inner roadstead.

In the outer roadstead, at from one to three miles from land, are from 6 to 10 fathoms of water; bottom of soft sand-stone covered with sandy oaze, and in which the anchor holds well. The coasters enter the inner road by two passes, formed in the reef, at 200 fathoms asunder; the depth in these passes is about 13 feet at high water. The export trade of this place is chiefly in cotton, hides, and the dried meat whereof there is so great a consumption in the southern provinces.

DIRECTIONS FOR SEARA, by CAPTAIN THE HON. W. WELLESLEY, commanding H.M.S. SAPPHIRE. (*Originally given in the Nautical Magazine*, 1833.)

SEARA cannot, with propriety, be called a port, nor in any but a tropical climate would it be thought a secure roadstead. I believe it to be perfectly safe, particularly from December to May, and we have the precedent of several large ships, namely, the American frigate *Constitution*, during the war; and, soon after the *Inconstant* and *Isis*, English frigates, having laid there with impunity.

When bound for Seara, run down in the latitude of Point Macoripe (3° 41′ S.) to which give a good berth, until the castle bears S.W., then run down direct for it until Point Macoripe bears E.S.E.; do not go any farther in until a pilot comes off, which will be in a catamaran. There are four high mountains at about five leagues to the S.W. of the town, which may be seen from a distance of nine leagues in the offing, and by which the port of Seara is easily recognized.

Point Macoripe being a sandy bluff, abruptly terminating, if you know your longitude nearly, it cannot well be mistaken, and the land on this part of the coast is moderately high. Running in toward it, you will discover the reef breaking off; and inside of it a good berth will open the town and show the steeple, &c.

From 11 and 10 fathoms, (standing in for the town,) you will shoalen your water to 7 and 6, when you may either anchor or heave-to, and wait for the pilot, should he be coming off. *If there are any merchant-vessels lading, they will be well to the westward, protected, in a small degree, by the reef.

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* In giving *Seara* for *Ciara*, we follow the pronunciation and general custom: but *Ciara* is the proper name.

The landing is very difficult and uncertain. It can be effected only from half-tide to half-tide, and then, by the help of the town's people, who, with their negroes, are in attendance, to carry you out of the boat in a chair. This is owing to the reef that lies in a direction parallel with the beach, and about 300 yards from it: these begin to appear at half-ebb, and then make a kind of breakwater until half-flood, when the water, dashing over them, creates a surf in which it is impossible for a boat to live.

The Pilotage charged for the Sapphire, at Seara, was eight Spanish dollars.

Remarks *on the* Port *of* Seara, *by* Captain Geo. Cheveley, *of Liverpool.*

"On going into Seara, I would not advise vessels to run too far into the Bay, but to keep within a mile inside the weather point, (Macoripe,) and, if possible, to avoid coming to anchor: for, as in most of the open roadsteads in Brasil, you will likely have to leave your anchor behind. Stand off and on, upon the west side of the Bay, and a pilot, on a *Jean guendo*, will soon come off, and run you into the harbour, (if it may be so called,) which is sheltered from the sea only by the reef of rocks, which are barely seen at low water. When at anchor within this reef, be careful to ride with a good scope of cable; for hard squalls are frequent, and I have driven with a clear anchor and 40 fathoms of chain. It is also adviseable to keep a good night-watch, and a second anchor in readiness to let go at any moment.

"While lying here, it appeared, from my observations, that the latitude of the anchorage was 3° 43′ S. Point Macoripe 3° 40′."

Many of the natives are grossly dishonest, while lost in ignorance and superstition. Even the upper grades may pride themselves on these *enviable* qualities. While Captain Cheveley's vessel was driving and nearly on the reefs, with the ensign union down, they kept up a constant fire upon her, from the fort, declaring that she was running away, in order to avoid the port-charges, although not one half of the cargo was on board; and, upon remonstrance, both captain and consignee were threatened with imprisonment.

COAST WESTWARD of SEARA.—From off Seara H.M.S. *Sapphire* proceeded on a N.W. ½ W. and N.W. course, along the land, at not more than four miles distance, in from 13 to 11 fathoms, until she arrived at the village of *Curú*, a distance of about ten leagues. When abreast of it, says the Captain, the decrease of soundings to 9 and 7 fathoms warned me off. There is a heavy breaking shoal extending from the point on which this village stands; and, in case any one not knowing his longitude should make it, it may not be amiss to state that we saw catamarans, with their sails hoisted to dry on the beach, which had exactly the appearance of large boats sailing upon a river, until the regularity of their distance, and a nearer approach, dispelled the illusion.

Hauling out from Curú, the water did not deepen for a considerable time. By the Sapphire's observations, Curú appeared to be in latitude 3° 28′ S. and longitude 39° 0′ W. In the Baron Roussin's Chart, a village, probably intended for the same, is represented in 3° 30′ S. and 38° 52′ W.

Resuming the Coast at Seara, we now proceed to observe that, from *Point Macoripe* the coast trends *N. 56° W., true,* to the meridian of *Mount Melançia*, a distance of nearly 19 leagues. This mount, so called, is an insulated sand-hill, near the coast. In the intermediate distance you pass, successively, before the mouths of the *Papina* or *Rio de Ciara Velha*, *Rio Cioppé*, and *Rio Curú*, with the *Morro*, or *Hill of Curú*, and the *Serra de Mandahú* in the interior of the country, called also the *Serra Grande.*

All this coast is steril and desert, in the part next the sea, and shows no trace of culture nor inhabitants; it being one undiversified series of low downs and loose sand. The coast is clean; and, at two or three miles from it, are found from 6 to 13 fathoms of water, with fine gray sand.

From Mount Melançia the coast takes a more westerly direction, and trends *N. 64° W. true,*

true, eleven leagues, to a village named *Almufedas;* then *N.* 69° *W.*, five leagues, to *Point Tapagi.*

The village of *Almufedas,* standing within the sand-down on the shore, is situated on the border of a small river, *Aracati-Miram,* navigable by coasters. From the offing its steeple may be seen among a group of coco-trees. It stands in 2° 56′ S. and 39° 48′ W.

This village serves to indicate the commencement of a bank which extends thence nearly to the little hamlet of Jericoácoará, situate about 40 miles more to the westward.

REMARKS ON COMING IN FROM SEA, TOWARD THE COAST WESTWARD OF SEARA.

VESSELS COMING IN FROM SEA, when bound to the westward or to the port of MARANHAM, may happen to fall in with the land as far to the eastward as *Seara;* in this case, as shown by Captain Wellesley, it will be found higher than any to the westward; and magnificent mountains, some leagues inland, (the only fine feature on the northern coast of Brasil,) will be seen. *Point Macoripe,* on the east of Seara, says the same gentleman, may be known by its being a sandy bluff, terminating rather suddenly. But, upon whatever part you advance, it will be needless to approach nearer than six or seven miles, until, in fact, the land is just clearly discerned off the deck; that is, *if your object be to make a passage.*

If you come upon the land toward the evening, and have run sufficiently near to make it out, as abovesaid, a N.W. by W. ½ W. course will not be more than a safe course to haul off on for the night, or you may stand off to 22 fathoms, in the parallel of about two degrees south, and inward to 7 fathoms. It is seldom, under any circumstances, that vessels find themselves farther off the land than they expected in the morning.

H.M.S. *Sapphire* was in less than 10 fathoms of water the whole of the first night she was on the coast; but Captain Wellesley has said that he would not willingly go so near again; being sensible, not so much of the danger, as the inutility of such a close approach.

DESCRIPTION OF THE COAST CONTINUED.

Between *Point Tapaji,* and the Point of *Jericoácoará,* above noticed, the coast trends nearly East and West, in a distance of 9 leagues; from *Jericoácoará* to the mouth of the *Rio Camucin* or *Camosin* it forms a slender bay, in extent 6 leagues; from the Camucin to another river, the *Tamonha* or *Tamonia,* it again trends nearly West, 5½ leagues; and from the latter to the *Iguarassu* 6½ leagues.

Off *Mount Melançia,* (longitude 39° 18′) noticed on page 69, a bank commences, which thence extends all the way to the *River Iguarassu,* an extent of 45 leagues. This bank, which is called in the country *Pracel de Caracu,* from the name of the most considerable hamlet on this part of the coast, extends outward about 3½ leagues from the shore, and is circumscribed by the depth of 6 fathoms. Upon the bank, off the village of *Almufedas,* there are 4½ fathoms at 5 miles from shore; and at 3 leagues North from *Point Tapaji,* are 6 fathoms: and there are similar depths thence westward all the way to the Iguarassu. From the edge of the bank, in 7 fathoms, the water gradually shoalens to half a fathom near shore: but owing to this gradual decrease in depth, there are no breakers. Those approaching may, therefore, advance safely, by keeping the hand-lead going.*

Large vessels coming in from sea, and proceeding westward, should keep off, at four leagues from the land; the coast being so low, that, at a safe distance, the tops of coco-trees only can be occasionally seen, and in the finest weather.

When you have advanced to about 8 miles from the coast, on the meridian of Caracu, [40° 11′ W.,] and continue on a westerly route, upon approaching a little nearer to the land you will discern some huts, which form the hamlet of *Castelhanos;* but this is not requisite for a vessel of any size; and those drawing 15 feet of water should not come nearer to the shore than 10 miles, where they will find 6 or 7 fathoms and less water, as well as to the westward of the meridian of *Jericoácoará.*

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* The coasters, having nothing to fear, sometimes enter, according to their draught of water, the mouths of the little rivers *Tapaji* and *Caracu.*—*M. Roussin.*

When you may be westward of Jericoácoará, the draught of the vessel and soundings will determine the distance to which it may be proper to approach the bight. The bottom here has been represented as sufficiently clear to allow a vessel to come in without danger, and as having 4 fathoms of water at half a mile from the cove.

JERICOACOARA.—This bight or cove is formed by the broken ridge or ledge of rocks, with which the coast is bordered, into a small basin between them and the shore. The waves commonly beat high on the reef, and break over it into the tranquil basin. On the shore may be occasionally seen the temporary huts of the *Sertanejos,* or the inhabitants of the *Sertao* or interior country. These huts are formed of perches fixed in the earth at one of their extremities, united at the other, and covered with cow-skins as a protection from the wind: they appear to remain only while the coasters come to take off the hides, &c. which are sold here, and which are produced in great quantities, by the cattle of the neighbourhood.

Admiral Roussin says that, in passing several days before Jericoácoará, several vessels were engaged in procuring poultry and cattle, of which there was a great number at a low price. These resources, in certain cases, navigators may be happy to find. No vegetable, however, fit for the nourishment of man, is to be obtained; and fish, though taken on the rocks or in the basin, upon the retiring of the sea, are not abundant.

By digging pits on the beach hereabout, potable water may be obtained. Spring-tides in the basin were found to rise from 10 to 12 feet.

According to M. Roussin, the down which forms the eastern shore of Jericoácoará stands in latitude 2° 47′ 28′, long. 40° 27′ 16″.—Variation of the needle, at two leagues to the northward, in January, 1820, 2° 23′ W.

The coast which follows Jericoácoará, to the westward, is a low shore of white sand, having, in the interior, clumps of small bushes, and without it the ridge or border of rock. Hence follow, in succession, as shown in the chart, the mouths of the little rivers *Camusin* or *Camosin, Tapuya, Tamonha,* &c., which may be seen on advancing very near to the shore. The first of these is the only one navigable for coasters of any draught; the others will admit boats only.

At from one to four miles of distance from this coast are found from 4 to 8 fathoms of water, bottom of oaze, sand, and madrepores, or coralline substances.

The PERNAIBAO, or PARANAHYBA, &c.—The portion of coast between the *Barra de Iguarassu,* the easternmost branch of the *Rio Pernaibao,* and the *Barra de Tutoya,* its westernmost, has generally been exhibited very incorrectly in the charts. The distance between the mouths is between 9 and 10 leagues, within which extent the Rio Pernaibaõ or Paranahyba discharges itself by four others, namely the *Barra Velha,* and the *Barras do Meio, do Caju,* and *das Canarias.* All these openings are formed by a groupe of low isles, composing the *delta* of the Pernaibaõ, and the five of which, next to the sea, afford excellent pasturage for cattle.

The HARBOUR of TUTOYA, on the west, has lately been described as the only harbour, along the extensive line of coast between Bahia, in latitude 13° South, and the Maranon, under the Equator, that admits of the bar being crossed at all times of the moon, by vessels drawing from 14 to 15 feet of water.

The BAR of IGUARASSU and the BARRA VELHA, the two easternmost passages, have become unnavigable for ships; and, in consequence of the formation of sand-banks to leeward, vessels now proceed to enter by the *Barra de Tutoya,* for which branch of the river a pilot may be obtained.

The *Bar* of *Tutoya* is described as of great breadth; some say six miles. The masters of two English vessels, who have sounded on it, never found less than 5 and 6 fathoms of water; but, as it has not yet been correctly surveyed, caution is required.*

The charts have exhibited a rock, called *Pedra do Sul,* between the Barra Velha and Barra do Meio; but M. Roussin says that this is not a danger really to be feared, being only a break of the reef on the coast, and does not extend more than a mile along shore. On approaching the coast hereabout, in fine weather, you may see, at the distance of 10 or 12 leagues to the south-eastward, the high lands of the interior, named the *Serras dos Cocos*, *Serras de Hybiappaba*, which are the last mountains that come in sight between this and Maranham, to those proceeding westward.

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* "The RIO DE PERNAIBAO, or PARANAHYBA, is one of the largest rivers in Brasil; and, in a commercial point of view, is of the highest importance. It is formed by three streams of the same name, that take their rise in the borders of the Sierra, which bounds the Province of Piauhy on the S.W. [Lat. 10° 45′ S.] The first tributary is the *Rio Bolsas,* the only one, in fact, that joins it on the

It is adviseable not to approach the coast of the embouchures or mouths of the Pernaibaõ nearer than to 4 or 5 miles, and not farther in than to a depth of 8 fathoms. The sea is very muddy, and the bottom of oazy sand before these passages; the ground is, therefore, bad for anchoring. Eight or ten fathoms may be found at 4 or 5 miles from land.

To THE WEST of the PORT of TUTOYA the coast gradually abates in height. The shore is composed of flats of sand, with woods in the interior only. The coast exhibits sand-hills of a shining white colour, without any verdure; and, having the appearance of linen cloths, or extended sheets, they have received the name of *Lançoes Pequenos* [*Little Sheets*,] in contra-distinction to a more extensive range to the westward, named *Lançoes Grandes*. [The *Great Sheets*.]

The *Lançoes Pequenos* occupy an extent of coast terminated on the West by the *River Perguiças*, near which are some breakers of the same name.

The RIVER PERGUIÇAS separates the Lançoes Grandes from the Lançoes Pequenos. A long spit extending from this river, is formed, as are all the banks, and even the islands on this coast, by the tide of the river meeting the current of the sea. H.M.S. *Sapphire* crossed this bank by night, in 5 fathoms, and the *Mersey* in 3½, but in 7 fathoms a ship will be quite close enough.

If the coast be made from the northward, about the Perguiças and Lançoes Pequenos, soundings will be struck in 19 or 20 fathoms, and soon after in 13; and from thence regular bottom will be found in 10 or 11 fathoms, until the vessel is close enough to haul off and steer along the land. The land hereabout is green, interspersed with sand-hills. It is low and irregular; but in one place there is an extent of a mile or two of white sand, crowned with green of a regular height.

In keeping at 8 or 10 miles from this part of the coast, you will be at a sufficient distance to avoid all danger; and thus you will have from 7 to 14 fathoms of water.

The River Perguiças is sufficiently deep for a large and well-constructed brig to some distance from its entrance; but the interior navigation is reported to be difficult.

LANCOES GRANDES.—The coast to the west of the mouth of the Perguiças trends *N.* 65° *W.* to *N.* 80° *W.*, on an extent of about 17 leagues. It resembles that which precedes it to the east. Its downs are of shifting sand, of a moderate height, and their extent very near 12 leagues. Nothing can more resemble white sheets extended on land; and this aspect is very remarkable, and useful as a landfall, to those coming in from sea, when bound to Maranham, &c.

According to M. Roussin, the eastern extremity of the Lançoes Grandes is situate in latitude 2° 34′ 12″ S., and 42°. 44′ 52″ W. The western extremity in 2° 21′ 0″ S., and 43° 12′ W.

MANGROVE COAST, &c.—Immediately to the west of the Lançoes Grandes, the coast entirely changes its aspect. Instead of being arid and devoid of verdure, it now appears as if wholely covered with bushes and groves, so closely set, that, at the distance of 4 miles the ground between them is not to be seen. The shore is low, and is called the *Praya das Mangues Verdes*, or *Beach of Mangroves*. The sudden transition of colour here, from that of the Lançoes, renders it impossible to mistake this portion of coast.*

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the left bank. Near this confluence the *Rio Urussuhy* enters it on the right bank, and comes down from the same Sierra. At 28 leagues lower down, the *Gorguea*, having taken its rise in the Sierra of the same name, and formed in the early part of its course the *Lake Pernagoa*, is incorporated with it. At 36 leagues farther, it receives the *Caninde*, which flows from the Sierra dos Irmaos to the N.E., and at six more the *Poty* falls into it. After 44 leagues of its course the *Rio Longa* joins it; at a little below which a small arm issues from the Pernaibao to the East, and forms a large lake, called *Encantada*, the island between it and the river being about 5 miles in length. At seven leagues farther down, this river divides itself into two rather unequal streams, and ultimately enters the ocean by six branches, separated by the five islands above mentioned."

"The distance of the *Villa de Pernaiboa* from the Barra de Iguarassu is about eight [*not eighty*] miles." See *Nautical Magazine*, Vol. I. 310, 312.

* At three miles to the north of Mangrove Point, M. Roussin found the magnetic needle, in the month of January, 1820, to be at *zero*. Hence we conclude that there is no variation here.

The portion of coast, several miles to the westward of the meridian of 43° 24′ turns abruptly to the west, and southward of west. Here you have in sight the island of St. Anne, which forms, with the continent and the Isle of Maranhaõ, or Maranham, the great inlet called the *Bahia de St. Jozé.*

ISLE of SANTA ANNA.—This isle, a little more elevated than the lands which precede it to the east, is equally covered with mangroves and other trees; and, with the exception of its lighthouse, offers nothing remarkable when it first comes in sight. On advancing, however, you will see the breakers which lie about and to the eastward of it, of which the easternmost are 8 miles from the N.E. point of the island. Near these shoals are from 7 to 24 fathoms of water; bottom of sand.

To the west of St. Anna's Island will be seen the breakers of the CORONA GRANDE, a vast flat of rocks and sand, nearly even with the water, and extending about 5 leagues to the northward from Maranham Island.

LIGHTHOUSE on ST. ANNA'S ISLAND.—This lighthouse, which was first lighted on the 1st of June, 1831, has been described in the notification as a square tower, having three distinct stories; each story diminishing as it rises. The angles bear North and South, and East and West. Its full height is about 90 feet above high water, spring tides.

In the day-time, the tower has the appearance of a vessel under sail. At a considerable distance, by night, it shows a *revolving light*, visible every thirty seconds, for about ten seconds together. At a shorter distance the lights show as a permanent light, like a bright star, with a brighter light every thirty seconds.

The Inlet or Bahia de St. Jozé, between the continent and Maranham Island, is too shoal and dangerous for a passage to the port of Maranham, even for small vessels. The general entrance is, therefore, by the Bay of St. Marcos, to the west of the Corona Grande, as will be shown hereafter.

The tide, as noticed on page 7, sets with great strength into the *Bahia de S. Jozé.* On the first time the *Sapphire* ran along the coast, she was set inside the reefs, obliged to anchor in 5 fathoms, and was thence compelled to steer out on a N.E. course, in order to get clear of them. The breakers, however, as we have noticed, always show themselves, and should be rounded in not less than 14 fathoms.

The same ship found anchorage in 7 fathoms, with the lighthouse on St. Anna's Island bearing W.S.W. ½ W., and Mangrove Point S.E. ½ E. Within the reefs the ground is bad.

CAPTAIN HEWETT'S DESCRIPTION OF, AND DIRECTIONS FOR, THE NAVIGATION FROM SEARA TO MARANHAM.

"From Seara the coast trends N.W. by W., 35 leagues, to *Point Tapaji,* and thence West, ten leagues, to *Jericoácoará*, the depth gradually increasing off shore; but a N.W. course should be pursued, in order to avoid the shoal parts of the *Bank of Caracu.* Having run one hundred miles upon the N.W. course, allowing a mile and a half per hour for the current's assistance, in soundings varying from 11 to 20 fathoms, change the course to W. ½ N., which is nearly the direction of the coast from Jericoácoará to Mangues Point; and it will give you a sight of the land as far as the island of St. Anna.

"When ships are bound to MARANHAM, from seaward, it is absolutely necessary to make the land considerably to the eastward; as the currents, in general, set very strongly between W. ½ S. and W.N.W. If, in endeavouring to make the land, you should be in latitude about three degrees South, on discovering it, you will be off Mount Melancia, or between it and Seara; if the latter, three other mountains will be observed to the S.S.E., lying nearly S.E. and N.W. of each other, which mountains are about 7 leagues to the westward of Seara, and are easily seen from that place. About this part of the coast you will have a bottom of fine sand and shells.

"If you should make land when you consider yourself in from latitude 2° 15′ S. to 2° 30′ S., and have a bottom of small red and white stones, you will be off Jericoácoará; if the bottom consists of yellow, blue, and red, stones, you will be off the *Paranahiba* or

Tamonia; and three mountains, lying nearly in the meridian of each other, in the neighbourhood of the latter, will be seen.

"The WHOLE COAST from POINT MACORIPE to PARANAHIBA, is sandy to about half a league inland, whence it appears well cultivated; so that it is easily distinguishable from the coast between Parnahiba and Green Mangues (Mangroves) Point, which consists of nothing but sand, without the least sign of vegetation.

"Inclining to the shore, and observing the *Lançoes* or sand-banks well, as you pass along, the entrance of the RIVER PERGUIÇAS will easily be distinguished. The sand will now begin to assume a higher and more irregular appearance; this height and irregularity does not, however, deserve the appellation of hills. When the PERGUIÇAS bears S.S.E. you will begin to shoalen your water to 8 or 9 fathoms, but a steady course should be pursued, as you will presently pass the spit formed by the sand washed from the river, and which, meeting the natural course of the current in the offing, inclines it to the N.W.

"If the day should be far advanced when you are off this part of the coast, haul to the wind under topsails and foresail for the night; standing off into 22 or 24 fathoms, and on into 12 or 14. It would not be adviseable to haul the wind before you are past the Perguiças; as, otherwise, you may be short of day-light for the operations of the ensuing day. At day-light you may bear up under all sail, pursuing the former course and distance from the shore, and toward the conclusion of the sand-banks, (*Lançoes*,) the land will begin to appear a little more fertile, and Green Mangues Point will easily be distinguished."

On the Shoals eastward of St. Anna's Island, the following remarks were made by *Captain Livingston,* on his voyage of 1824.

"A dangerous shoal exists at about 10 or 11 miles to the eastward of St. Anna's Island. Many vessels have narrowly escaped it. We got into 3 fathoms, with St. Anna bearing W. by N. The bottom was of fine sand, in ridges, with even 10 fathoms between; but I have no doubt that there are also coral rocks, from the manner in which the sea broke, at a little to the westward of us. About the same time, a French brig in company, the *Cæsar*, of Marseilles, struck and unshipped her rudder, at about a mile and a half to the N.E. of us, though her master assured me they had never found less than 6 fathoms. We had one cast of only two fathoms, but did not touch; so the lead must either have hit the top of a coral rock or else a knob of sand.

"*The Island of Santa Anna* shows quite level in the direction we made it, and I think cannot be less than 12 miles long, in place of two or three, as commonly laid down. I have spoken with many who concur with me in this opinion, and one who has been on it, states it as 12 miles long, and 3½ or 4 broad.

"From the appearance of the island* and the depths of water, both the French captain and myself thought we were on the *Coroã Grande,* or *Grand Crown,* to the westward; and, as night was rapidly coming on, we both anchored:—we in 19 fathoms, and he at half a mile west of us, in 25 fathoms.

"The CÆSAR'S SHOAL, (so called by me from the French brig above-mentioned,) lies about two miles South, and as much East, of the place we anchored at, the evening after we were in such shallow water on it. The shoal I consider very dangerous, and think it extends three miles and a half East and West, and three North and South; but there is, at least, one other at a short distance South of it.

"I have conversed with several intelligent masters, who have been in the Maranham trade. Many have seen it. All of them seem to think that the safest mode for those bound to Maranham is to get into about 2° South, or a little to the southward of 2°, and run, with great caution, until *Mount Itacolumi*, on the western side of Maranham Bay, and which cannot be mistaken, if seen; and I incline to their opinion: as thus, though it may occasion a little more watchfulness, repays it in safety; keeping vessels clear of the *Cæsar's Shoal* and the Coroã Grande, as well as making them sure of not getting into the Bay of S. Jozé.

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* It is to be recollected that, at this time, the Lighthouse was not erected.—EDIT.

"It is to be observed that the Cæsar's Shoal lies in the very track formerly pointed out in the Sailing Directions for making Sta. Anna; and if the frigate *Inconstant* had run on her course a few miles farther, as shown on the chart by Captain Hewett, without hauling up, she must have discovered it."

Captain Hewett's Directions go on as follow:—"When you lose sight of the Island of St. Anna, bearing about S.S.E. you will be abreast the Great Crown Bank, [*Coroã Grande*,] and should keep a good look-out to the southward from the mast-head; and, if breakers should be discovered, or if you shoalen your water to less than 18 fathoms, haul out half a point, but no more. Your distance to be run on a N.W. by W. course will be about 13 miles, and on the westerly course, 11 miles, including one mile per hour upon each for the assistance of the current, before you alter the course to W.S.W.; which, having done, without fear, look out for MOUNT ITACOLUMI a-head, and the TAPITAPERA coast on the larboard bow." This mountain and coast are described hereafter.

M. Roussin says that the breakers of the Coroã Grande, with those of the Isle of St. Anna, may sometimes, in clear weather, be seen from the mast-head, at 3 leagues off, and from the deck of a corvette, or sloop, at half this distance. They are divided into several groupes, and always show, although the tide rises 12 feet. The only difference in their appearance is produced by the state of the tide, or the greater and less elevation of the waves. The northernmost point of the breakers on the Coroã Grande is given by the Baron as in latitude 2° 10′ 50″ S., longitude 43° 57′ 32″ W. Captain Hewett previously gave it as very nearly the same.

On approaching the Coroã Grande from the North, when the sky is not clear, you may distinguish the coast of Maranham Island from that of St. Anna by its being higher, its masses woody, the configuration varied, and a bald white shore on the North.

MARANHAM.—DESCRIPTION, &c.—The BAY of SAN MARCOS, [St. Mark] or Maranham Bay, is comprehended between the Island Maranhaõ[*] and the continental coast on the west. Its principal entrance lies N.N.E. and S.S.W. The bay is navigable, in the greatest part of its extent, for large vessels, and frigates may anchor before the HARBOUR OF ST. LUIS, the principal port of the bay, situate on the western coast of Maranham Island.

The entrance of the bay, being limited on each side by the dangerous shoals shown on the chart, must be approached with caution.

In this entrance, between the Corona Grande on the East, and the continent on the West, is a shoal 3½ miles long, N.N.E. and S.S.W. It is called the MIDDLE BANK, and was originally surveyed by Captain Hewett, as shown in his particular plan of the bay. The depths over it varied from 6 to 2½ fathoms, and it seems probable that there may now be less water upon it. Its western side is steep, and should be approached with caution. On the eastern side the soundings are more gradual, but the channel on this side is narrower than formerly. The Middle Bank latterly has been described as connected with the Corona Grande, being divided only by a swash between, of 7 to 9 fathoms. It is not, as may have been supposed, the one by which vessels generally enter, the Western being the superior and ordinary channel.

ST. LUIS.—The city of St. Luis, the capital of the Province of Maranham, is the seat of government and of the bishop. It occupies two small hills, situate at a short distance, East and West from each other, and separated by a little valley. Several buildings are remarkable from their size, particularly the public edifices, several convents and churches, of which the principal is the cathedral, occupying the north side of a square plain, covered with grass, and lying before the palace of government. The streets are generally at right angles, but the inequality of the ground renders a walk fatiguing.

Vessels may find at Maranham the chief resources required by the exigencies of navigation. The safety of the port permits careening; the water is good and abundant, and, on the island, beef and rice are easily gotten; but if in want of considerable quantities, they may be most advantageously obtained on the Alcantra or continental coast: because this is, in every respect, more fertile than the island, and more abundant in cattle, fruits, &c.

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[*] MARANHAN or MARANHAM. It is to be regretted that we have not yet a standard nomenclature for proper names.

In 1820, the population of St. Luis was estimated at 16,000, and that of the whole island at 40,000.

M. Roussin says that the temperature of the air is very high in the city; more especially from the month of December to that of June. St. Luis, standing on the west side of the island, does not experience, generally, the salutary winds from the eastward; those which arrive being very weak.

With regard to the winds and other phenomena, the year may here be divided into two seasons; winter, which begins in December and ends in May, and summer, which prevails during the other six months. The first of these two seasons is that of the rains; they fall abundantly, and are accompanied with violent storms, especially in the months of February, March, April, and a part of June. The thunder and lightning are then almost permanent, and, in the squalls, the wind blows with great force from the North to the S.W. by S. Nevertheless, they do not experience at Maranham *hurricanes*, properly so called; and even in the worst times there are long intervals of tolerable weather. There are frequent falls of rain in the summer; and, in this season, the regular winds are mostly from E.S.E. to N.E. by the East. These being the *general winds.* See more particularly upon this subject, page 5.

The air at Maranham is generally healthy; but, in the season of the rains, fevers of a dangerous nature at times prevail, though they commonly yield to appropriate treatment. The best preservative is a regimen exempt from excess; the chief remedies are the evacuants, particularly the emetic.

The commerce of the port consists in cotton, rice, hides, ginger, and ipécacuanha. The quantity of the first article, cotton, exportable in 1820, amounted to 70,000 bags, of the weight 170 lb. each.

The Tides are regular at St. Luis, and in the Bay of St. Mark. At the anchorage before the harbour of St. Luis the flood sets to the S.S.W. and the ebb N.N.E. The velocity is one mile and seven tenths an hour, in ordinary tides; spring-tides two miles and a half. In the last case, the difference of level between high and low water is 16½ feet, according to observations made 36 hours after the full moon of January, 1820, near Fort St. Antonio. In ordinary tides, the vertical rise of water is not more than 10 feet. High water in the harbour, on the full and change, at 7 h.

Description by Mr. Henry Koster.—This gentleman, in describing the Port of Maranham,* says that they took the channel to the eastward of the Middle Bank, then passed the Fort of St. Marcos, and came to an anchor very near to the sand-banks at the mouth of the harbour of St. Luis. No pilot came off, and the master, with Mr. Koster, got into the boat, intending to fetch one, when a signal with an enormous speaking-trumpet gave orders not to proceed to the city, and they were informed that a pilot would come in due time. A pilot at length arrived, accompanied by a soldier and custom-house officer. As the brig went up the harbour, she received the health and custom-house visit, composed of men smartly dressed; the administrator of the customs being in the uniform of a cavalry officer; but the regulations of the port proved both tedious and troublesome.

The City of St. Luis, from the shore, on the west, extends nearly one mile and a half in an E.N.E. direction. It comprises some small streets and squares, but is, altogether, built in a straggling manner, airy and pleasant, but is too much sheltered from the sea-breeze, with which it would be more salubrious. The computed population includes negroes, of which the number is great. Many houses, of one story, are neat and pretty. The churches are numerous, and there are several convents. The governor's palace stands upon rising ground, not far from the water-side, with the front toward the town. It is a long uniform stone building, of one story in height. The ground upon which the town stands is composed of a soft red stone; so that the smaller streets, leading from the town into the country, some of which are not paved, are full of gullies, through which the water runs in the rainy season. The dwellings here, consisting generally of a ground floor and thatched roofs, have a miserable appearance.

The following is Mr. Koster's description of the harbour, &c. "*The harbour* is formed by a creek in the island, and is to be entered from the Bay of St. Marcos. The channel is of sufficient depth for common sized merchant-ships, but is very narrow, and not to be entered without a pilot. Opposite to the town the water is shallow at the ebb.

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* In or about 1818, therefore prior to the visit of M. Roussin.

"The island of Maranham forms the S.E. side of the Bay of St. Marcos, consequently this bay is to the westward of it. To the eastward of the island is the bay of St. Jozé. From some similarity between the Point of Itacolumi, by which vessels are in part guided, when about to enter the Bay of St. Marcos, and another point of land upon the small island of St. Anna, which is at the entrance of the Bay of St. Jozé, instances have occurred of vessels mistaking the latter for the former, and entering the Bay of St. Jozé.* This error causes great danger and inconvenience; because, owing to the prevalence of easterly winds, it is next to impossible for a vessel to beat her way out of it. It is, therefore, necessary that she should go through the narrow channel, between the main land and the Island of Maranham, a passage of considerable difficulty.

"The Bay of St. Marcos is spotted with several beautiful islands. The width, from St. Luis to the opposite shore, is about four leagues. Its length is much greater; toward the south end there are several sand-banks, and the water is shallower. It receives here the waters of a river, along the banks of which are situated several cattle-estates; but the River Itapicuru, which runs into the narrow channel between the main land and the island, enjoys the greatest share of cultivation; its banks are extremely fertile, and upon them have been established the principal plantations of cotton and rice, which are the two chief articles of commerce from Maranham. The island is, in itself, very little cultivated. There is no considerable plantation upon it. A few of the rich merchants residing in the city have country-houses distant from it about one league, but the remainder of the lands are left untouched; owing, it is said, to the unfitness of the soil for the purposes of agriculture.

"The importance of the province has increased very rapidly. Previous to the last sixty years no cotton was exported; and I heard that, when the first parcel was about to be shipped, a petition was made by several of the inhabitants to the *Camara*, or municipality, requesting that the exportation might not be permitted; for, otherwise, they feared that there would be a want of the article, for the consumption of the country; this, of course, was not attended to; and now the number of bags, exported annually, is more than 50,000; averaging about 180 pounds weight each. The quantity of rice grown there is likewise great; but the sugar which is required for the consumption of the province is brought from the ports to the southward. Some sugar-cane has lately been planted, but hitherto molasses only have been made. I heard many persons say, that the lands are not adapted to the growth of the sugar-cane. The cotton and rice are brought to St. Luis in barks of about twenty-five or thirty tons burden. These come down the rivers, with the stream, from the plantations; their return is not, however, so easy, as they are obliged to be rowed or warped, but being then empty, or nearly so, the difficulty is not very great.

"Considerable quantities of manufactured goods have been sent out from Great Britain since the opening of the trade, as has been done to the other principal ports upon the coast; but a ready sale has not been found for them here to any great amount. The province of Maranham will not bear comparison with that of Pernambuco. It is still in an infant state; there still exist wild Indians, and the plantations upon the main land are in danger from their attacks. The proportion of free persons is much smaller; the slaves very much preponderate; but this class can, of necessity, use but little of what is in any degree expensive, of what in such a climate is mere luxury. There exist at St. Luis a great inequality of ranks; the chief riches of the place are in the hands of a few men, who possess landed property to a great extent, numerous gangs of slaves, and there are also merchants. The wealth of these persons, and the characters of some of the individuals who enjoy it, have raised them to great weight and consequence; and indeed one governor knows, to his cost, that, without their concurrence, it was useless to attempt the introduction of the innovations proposed, and impossible to trample long upon the rest of the community. But the great inequality of rank bespeaks the advancement of this place to have been less rapid than that of other settlements farther south, where the society is more amalgamated, and property more divided. As a port of trade with Europe, St. Luis may be accounted the fourth establishment upon the coast of Brasil in point of importance, giving precedence to Rio de Janeiro, Bahia, and Pernambuco."

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* This will, in future, be obviated by the Lighthouse.—EDIT.

The town of ALCANTARA or ALCANTRA stands on the western bank of the bay of St. Marcos. It has been described by Mr. Koster, who proceeded to it in a sailing boat, from St. Luis. The beauties of the bay, Mr. Koster says, are to be seen only in crossing it. The number of islands diversify the view every five minutes. There is but little water on the bar of Alcantra, and as much pilotage is necessary as with a large ship in proceeding to St. Luis. The town stands on a semi-circular hill, and at first sight from the port seems very pretty, but falls short of its promise on a nearer examination. Many of the houses are one story in height, and are built of stone; but the major part have a ground-floor only. It extends back to some distance, in a straggling manner, with gardens, &c., and is an improving place; the lands in the neighbourhood being in request for cotton-plantations. It has a stone kay, a town hall, prison, and several churches.

Not far from the mouth of the Port of Alcantra is an island, about 3 miles long and one broad, called the *Ilha do Livramento:* it is inhabited by one man and one woman, (1816,) who have under their care a chapel dedicated to our *Lady of Deliverance*, which is visited by the inhabitants of the neighbouring shore once every year, for the purpose of celebrating, by festival, this invocation of the Virgin."

PIMENTEL says, "Whoever goes to the MARANHAÕ, (or MARANHAM,) ought to make the coast during the months from December to July, because these are the winter rainy months, in which season the land appears clear and bright, and no high winds then prevail on the coast; but August, September, October, and November, are the windy months, and the land during that season is constantly covered with a thick haze; and the higher the wind the more hazy it is. The winds which are constant on this coast are the N.E., E.N.E., and East, which are all fair to go into and out of the harbour. On the coast, in general, you may anchor at two leagues from the land, but it should not be in less than 8 fathoms at high water."

The soundings, as now laid down on the charts, in the vicinity of Maranham, are to be depended on, and will therefore be found extremely useful in making the harbour, to ships coming in between the parallels of one and two degrees South, more especially in hazy weather, when observations for longitude cannot be obtained.

MARANHAM, with its environs, have been copiously and happily described by Mr. Webster, in his interesting 'Narrative of the Voyage of the *Chanticleer*,' from which we take the following extracts.

The island on which the city stands is separated from the continent by an arm of the sea, and is about 21 miles long by twelve broad. This city, notwithstanding its situation on an island, is the capital of a large province of the same name, and derives all its importance from the harbour, which is the principal one on that part of the coast.

The harbour possesses merit only by comparison with the few smaller on the coast. The entrance to it is extremely narrow and shoal, so that vessels can enter it at high water only; for, when the ebb has ceased, the shoals are so bare that a person might walk across the upper part of the harbour. It is snug and well protected, affording secure and commodious anchorage for several ships. The tides are rapid, rising 18 or 20 feet; the anchorage is close to the town, where there is a very tolerable landing place. Strong winds seldom or rarely blow in so as to create any uneasiness among the shipping.

The harbour presents a cheerful scene, more particularly to a stranger, unaccustomed to the novelty he meets there. There is something enlivening in seeing the numerous coasting vessels skimming along the surface of the water; the peculiarity of their rig, and the extraordinary thatched awning with which they are partly covered, their sails being of the lightest material and fit only for the fine weather and light breezes which prevail on the coast.

The business of these vessels is to transport cotton from one part of the coast to another. Whole fleets of fishing boats are seen cruising about, some going out to their fishing ground and others returning, the arrival of the latter being announced by the sounding of horns, which may be heard far and near; and in the midst of these the attention is continually excited by the incessant crossing and recrossing of canoes manned by African negroes. Some of these canoes are large, and have crews of 12 or 14 persons, who use their paddles with great dexterity, and all the energy peculiar to the negro.

The country about Maranham is by no means attractive. It is without any peculiar features, rather pleasing, here and there picturesque, fertile, and well wooded; and when the distant hills and neighbouring heights of the main land are seen skirting the horizon of the bay, the effect is rather pretty. The banks of the river are adorned with a few country seats, the residences of wealthy proprietors.

The city itself is seated on the eastern shore of the harbour, upon a jutting promontory or neck of land, and is nearly surrounded by water. It occupies the highest ground in the neighbourhood, and is 90 feet above high water mark, being about a mile in length and half a mile in breadth, and is irregularly built. The exterior of the city has but mean pretensions, and the most respectable parts of the interior are very little better. The streets are narrow, many of them of a low mean appearance, and without a handsome one among them.

There is nothing in Maranham that particularly attracts the notice of a stranger, unless it be the coco-nut tree, gracefully waving its lofty plume above the houses, and imparting a tropical character to the place.

Near the water side is the market place for the sale of fruit, vegetables, and poultry, with shambles distinct from all. Beef and pork are the only meats to be had there, and these of a very indifferent quality: but the town is generally well supplied with country produce, which is both reasonable and good. Besides the principal market place there are several other smaller ones in different parts of the town. The bread is excellent, the poultry good, the fruits and vegetables abundant, wines and groceries of a good quality, especially Port wine. The town is in no want of water, wells are attached to most of the houses; but the water in some parts is said to be rather brackish, so that which is used for drinking is brought by the boats from some miles distant and distributed for sale. The mangrove is the usual fire-wood burnt here.

The population is estimated at 17,000, the greater part consisting of African slaves; the rest are Brasilians, Portuguese, and foreigners. The commerce, trade, and revenue, consist in cotton and rice, which are the two staple commodities. Of the cotton, 80,000 bags are annually exported to Liverpool. The rice is taken principally by the Portuguese, hides and horns by the Americans. There is a Brasilian packet from Rio Janeiro to Maranham, and from thence to Para, every month.—*Webster, vol.* ii. p. 28 to 66.

SAILING DIRECTIONS FOR MARANHAM.

The winds in the environs are mostly from the eastern quarter. It is, therefore, to the eastward that the coast is made, whether arriving from Europe, Guyana, or the West Indies. The only exception is with wind at times between the North and the West. At all other times you gain a sight of the *Lançoes Grandes*, as shown page 72. This shore of white sand may be seen to commence about 20 leagues E. by S. from the Isle of St. Anne, and extends, as we have shown, to the verdant coast of Mangrove, which terminates in a great elbow of land, under the meridian of 43° 28′ W.[*]

Off the coast, at 4 or 5 miles from the Great Lançoes, are from 5 to 6 fathoms of water; but by an error in longitude, very presumable hereabout, you may easily mistake the *Smaller* for the Greater Lançoes; but observe that, when off the latter you will have the shoal-grounds of the River Perguiças to the East, in place of being to the West while off the former. In order to avoid all uncertainty in this respect, hold off to 10 or 12 miles from the coast, and continue your course from 6 to 10 fathoms. At this distance from land you will be between the parallels of 2° 15′ and 2° 30′ S. on a mean direction of W.N.W., which is that of the coast.

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[*] Blaesdale's Coral Reef.—It is particularly to be observed by those who are making for the S.W., when approaching the Equator, that, near the longitude of 41°, lies a dangerous reef, the existence of which is indisputable, though the exact longitude is not known.

On the 15th of October, 1819, the brig Richard, of Ulverston, Capt. Blaesdale, struck on this reef, in about 0° 56′ or 0° 57′ North of the Equator, and longitude, by account, beyond 41° W.—The following is an abstract of the Richard's log. "Friday, 15th of October, 1819; fine moderate weather; ship going three knots; at 6 *p. m.* grounded; did not remain fast above ten minutes. Water smooth; saw no breakers. In a few minutes after sounded, but got no bottom with 125 fathoms of line. Latitude at noon, by good observation, 0° 57′ N. Run west until 6 *p.m.* Long. 41° 22′ W. The vessel drew eleven feet of water; in one hour there were 18 inches of water in the well. When the ship arrived at Para, whither she was bound, three holes were found, each about the size of a man's hat, and nearly through her bottom, and several large pieces of white coral were sticking in different parts."

Having reached the meridian of 43° 12′, which is that of the beginning of the beach of *Mangues Vertes*, and at 7 or 8 miles from shore, you must shape a course northward, in order to avoid the Cæsar's Reef and St. Anne's Breakers, which exist as described in page 74.

Mark well that, in this traverse, the tide will require attention, and a due allowance for it must be according to its direction and strength. The flood, on this part of the coast, as already noticed, sets to the S.W. and the ebb to the N.E., sometimes with a velocity of two miles in an hour.

Having passed the breakers to the north of the Isle of St. Anne, which may be known by the lighthouse, continue to steer to the West several degrees North, until you come in sight of the breakers of the *Corona Grande*, which may be approached to the distance of two miles. Having passed within sight of these breakers, you may find soundings of fine sand, with black and red specks, which is a quality of ground common hereabout, as shown by the charts.

The first point of Maranham, which will be seen to the southward, on passing the banks of Corona Grande, is that of *San Marcos* or *St. Mark*, which gives its name to the Bay. It is a high bluff point, and on its height is a guard-house and signal-staff. A broad shelf extends from and to the S.W. of the point, along the coast, with flats of rock and sand, to more than 400 fathoms from the shore, which must therefore be approached with caution.

On continuing the route to the S.W. and S.W. by S. you will make the parallel of the little fort *San Antonio de la Barra*, situate on the point *das Areias* or *Arcas*, which is the north point of the entrance of the harbour of S. Luis. Here ends the flat of rocks and sand above noticed, and to the point you should not approach nearer than half a mile, at which distance may be found from 35 to 40 feet of water, where you may anchor.

The best and most frequented route to St. Luis is taken by gaining a sight of the *Morro Itacolumi*, before mentioned, a small mountain of the continent, upon the western coast of the Bay of St. Mark, nearly on the parallel of the North part of the Corona Grande; this mountain resembles in shape a pointed cap with very broad sides; it is entirely covered with bushy trees, and may perhaps be seen at 5 leagues off, in clear weather. By this insulated hill, the coast may be readily known: the land to the north of it suddenly taking a western direction, and to the southward are red cliffs, trending S.S.E. There is no similar mark in the vicinity; and it is, therefore, noted both on arrival and as a point of departure. Its situation, as shown in the Table of Positions, is 2° 8′ 38″ S. and 44° 24′ 24″ W.

On approaching Mount Itacolumi it appears in the shape of a gunner's quoin, and is remarkable only from the low land in its vicinity. From the lighthouse on St. Anna's Island, it bears W. ¾ N. nearly 15 leagues. When this mount is descried, shape a course to bring it to bear W.N.W. and according to judgment, about 4 leagues distant,* thence proceed, with the lead going, S. by W. 4 leagues, when you will have St. Mark's Point bearing South, at about 3½ miles distant.

St. Mark's Point, having on it a square tower, cannot be mistaken. On approaching the point, a sand-bank, dry in many parts, will be seen at about two miles N.N.E. of it; the *Banca da Cerca*, or *Acercas Bank*, to the westward, will also be seen breaking in many places. Between these is the channel to ST. LUIS' ROADS. On passing St. Marcos' Point, the rocks will be seen to the westward of it; but by giving them a sufficient berth, and bringing the body of the *Isle do Medo* to bear S.W., and the fort on *Ponto das Areias* S.E., you anchor in 15 fathoms, sand and mud. On the foul ground off St. Mark's Point, many anchors have been lost.

The best anchorage before the mouth of the harbour, is at 600 fathoms to a mile from Fort St. Antonio, or Ponta das Areias, with the fort bearing S.E. by E. ¼ E. In this position there are from 30 to 45 feet of water, at low ebbs. Small vessels go higher up, toward the bank of the Isle do Medo.*

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* From this spot *Ponta Tatinga* or *Alcantra Point* will be open of Point Piraremo, and bear S.W. by S. Here anchor, if the night is far advanced or the weather thick.

The anchorage before St. Luis is bounded, on the South and South-west, by the *Ponta da Guia*, appertaining to Maranham, by the Isle Medo, and several shoals on which there is little water at low tides; to the East and the N.E. by the coast of Maranham; to the S.E. by the banks which bound the south side of the entrance into the harbour; lastly, at about two miles to the N.W., by the Bank da Cerca, before mentioned, and which has, in some places, only 6 feet over it at low water.

Besides the passage on the N.E. of the bank, leading to the anchorage, there is another on the S.W., between it and the Isle Medo; but the latter is taken only with winds between North and South by the West; when they are easterly, it is obvious that, for attaining the roadstead, the passage by the Maranham coast is always preferable.

The entrance of the harbour of St. Luis is not difficult for small vessels, but those of greater draught cannot tack in the channel, unless the wind be favorable; and they must have a pilot.

The least depth found on the bar of St. Luis, in 1820, was 11 feet at the lowest ebbs, and nearly 27 feet at high water; but from a subsequent examination it appears that there is now less, and that the channel is growing up. The mud-bank on the south side of the channel is partly dry at half tide.

Those vessels whose draught will not allow them to enter the harbour of St. Luis, and which may require some repair, may find a tranquil anchorage in the little bay or cove of *Ataki*, to the S.W. of Maranham, having a bottom of mud or oaze, with 15 or 16 fathoms of water; the current less rapid than before St. Luis, and the sea always smooth. After doubling the Isle Medo on the West, the distance to it is one or two miles.

DIRECTIONS GENERALLY FOR PROCEEDING TO MARANHAM, &c.

(*By Captain the Hon. Wm. Wellesley.*)

The best landfall for vessels from sea is the *Lançoes Grandes*, between longitude 42° 45′ and 43° 12′, the whiteness of which, *already described*, is remarkable. Crossing the equator in longitude 40° 40′, the true course to this coast *(not allowing for current)* will be S.W. Run boldly to the western extremity, and you will thence make the green or verdant land about *Mangues Point*, with the lighthouse on St. Anna's Island, &c.

In proceeding for Maranham, it may be supposed that the land is made in the morning about the *Lançoes Grandes*. You will be running down to near the land, probably on a S. by W. course. Having seen it clearly, haul off to W.N.W., and, having arrived at their termination, you will run about 10 or 15 miles along the coast, nearly quite green, the '*Mangues Verdes*.' From the mast-head St. Anna's lighthouse will be in sight as you run along, bearing, perhaps, about S.W. by W. It will be seen before the island on which it stands, and makes like a vessel under sail. You are not sure of making the island itself, until Mangues Verdes, or Green Mangrove Point, bears S. by W.; and it is essential to bear in mind that the lighthouse is not on the northern extremity of the island. The dangerous shoals which run in a N.E. direction off it will now be made out: and if you think the flood is setting you in, haul off in time to N.W. by W.

Having brought the reefs of St. Anna's island abaft the beam, a W. ½ N. course may be steered with safety until the '*Coroa Grande*' breakers are passed. A N.W. by W. course has been recommended, but the Sapphire steered W. ½ N. on the flood, in perfect safety, making the two breakers; but steering the same course upon the ebb, she was obliged to keep away W.S.W. to make them.

The *Coroa Grande shoals* always break, and Captain Wellesley says, 'I think it better to make them, because you get a fresh departure, which is advantageous if night be coming on, and you wish to anchor. If you do not wish to make them, W.N.W. may be steered for 15 or 20 miles, and then West, until Itacolumi is seen a-head. This mountain is the highest land on the coast, and makes at first like a small round island. Almost immediately afterward the adjacent land appears, and then it takes something of the shape of the quoin of a gun. I think fifteen miles the very utmost distance at which this land can be seen, and it is likely that you will not be more than ten or twelve miles off when it is reported from the mast-head. The less water you have the closer you will be to it.

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* Captain Wellesley has noted two spots for anchorage; the first in 16 fathoms, with the fort S.E., and that of St. Mark E.N.E.; the second with Fort S. Antonio E. ¼ S. and Fort St. Mark N.E. by E. These marks show the extremities of the good ground; the second station is recommended as the best. The Sapphire never lost an anchor; while vessels near her commonly did.

If, in approaching, you should have as little as nine fathoms, or less, haul off to the South, and gradually keep away again to S.S.W., when you deepen the water, which course will take you up to *St. Mark's Fort.* If, on making it, there should be a depth of 14 fathoms, S.S.W. may be steered at once. In running up this course, bear in mind that the flood sets toward *Alcantara* and over the *Cerca Bank,* and the ebb, on the contrary, will check you over to the Middle Bank, and toward the edge of the Coroa Grande.

Now look out for St. Mark's Point a-head: it ought to bear from S. by W. ½ W. to S.W. by S., and should you be in the middle of the channel you will hardly gain soundings with the hand-lead; should you have as little as 9 or 10, you will be upon the edge of the *Middle Bank;* and, as a precaution, should keep half a point or a point more to the westward; fourteen fathoms is a very good depth to run up in all the way, and you may anchor in that depth off *Fort St. Antonio.*

The land about St. Mark's, when first seen, makes like two small islands, the easternmost one having two sand-hills upon it, which look like two roads. The round fort and flagstaff soon appear, for which keep the ship's head, and Fort St. Antonio will be seen like a long low red house, a little to the westward of St. Mark's. When you are within a mile of St. Mark's Fort, run along the land until you bring the fort to bear N.E. by E., and Fort St. Antonio E.S.E., then drop your anchor in from 10 to 14 fathoms.

When near the anchorage, the only danger to be apprehended in a large ship is from the *Banca da Cerca,* which lies at about a league off shore, and the northern point of which lies nearly N.W. from St. Mark's. Unless there be a very strong tide running, or the ship is beating up, you do not come near this; if you should, however, the soundings decrease very gradually, and indicate its vicinity.

In beating out, the pilot took the Sapphire out over its north end, in 5 fathoms; and at low water there *may be* over its centre as little as 16 feet. A mark for clearing it is, not to shut in with Point Ataki the two small isles [*Espera*] which lie off it. But, in common cases, the bank does not lie within the track.

It seldom happens that vessels have to beat from Itacolumi to Maranham, the wind being almost constantly to the eastward; but they usually have to beat out. One tide ought to bring the mount to bear from W.N.W. to West, when the pilot leaves.

They go about in from 9 to 12 fathoms on either side. The Sapphire was twice in 6 fathoms, off the *Carnaveros* or *Pirajuba* Banks, which were found to extend farther out than as laid down. The Baron Roussin's soundings are correct, but perhaps, in certain places, he gives rather too much water. His details of the coast, such as the entrance to rivers and other minutiæ, are partially erroneous; but it is to be recollected that his was a *survey made under sail.*

The Eastern Channel has latterly grown up, and is now disused by all excepting small coasters. Having once sighted Itacolumi, it would be difficult to get a vessel into the Eastern Channel, so much more simple and direct is that on the west.

REMARKS and INSTRUCTIONS for MARANHAM, &c., by LIEUT. E. STOPFORD, Commander of H.M. Sch. *Pickle,* 1832.

The preceding description and remarks, by the Honorable Captain Wellesley, have been amplified and confirmed by those which follow, from the pen of *Lieut. Stopford.*

Vessels bound to Maranham may cross the equator in longitude 40° W., which will enable them to fetch the *Lançoes Grandes,* a landfall deservedly recommended by Baron Roussin. It has been customary to make the lighthouse on the Island of Santa Anna, but an error in the longitude will be of less importance in making the Lançoes Grandes.

A vessel arriving off Santa Anna, and not having sufficient day-light for finding her way into the Bay of St. Mark, may lie-to for the night, off and on the lighthouse, keeping it as near South of her as possible, distant 6 or 7 miles. The light may be seen about 15 miles off.

As there is constantly a heavy swell on the coast, anchorage should be avoided, if possible, as recovering the anchor is both difficult and dangerous.

Having passed St. Anna's Island, if a vessel steers W. ½ N. she will pass the breakers of Coroa Grande at the distance of about three miles, and Itacolumi will be descried, bearing about West. When distant about 10 or 11 miles from this hill, change your course to S. ½ W. till the fort and flagstaff of St. Mark are made out nearly a-head.

St. Mark's Point should not be passed at a greater distance than a mile and a half, and so that the Cerca Bank, on the starboard hand, may be avoided. A reef of rocks extend from the point, and in order to avoid these it should not be approached within three-quarters of a mile. Within these limits a vessel may coast along until Fort Antonio bears East or E. by S., when she should anchor, and wait for a pilot.

By following the route to Maranham above prescribed, a vessel will avoid getting entangled among the swashways of the shoals of the Coroa Grande, which are very dangerous.

The inhabitants of Maranham, in consequence of their harbour's filling up, expect to be obliged to transfer their port of shipment to Alcantra. Lieut. Stopford, who visited this place, is of opinion that it is preferable, in every respect, to Maranham, being easier of access, capable of containing more ships, and allowing them to get in or out, at any time of the tide, with the prevailing winds. The depth of water is, also, greater. H.M. Schooner *Pickle* was anchored at about one-third of a cable's length from the shore, in 7 fathoms, at low water, being more than in any part of the harbour of Maranham, even at high water.

GENERAL REMARKS ON QUITTING MARANHAM, AND RETURNING TOWARD EUROPE.

It has been already noticed that, on the northern coast of Brasil, in general, there is no difficulty in proceeding along it with the prevailing winds. During five-sixths of the year these winds blow from E.S.E. to E.N.E., and it is easy to proceed to the North, and even to gain a little to the East, by governing the starboard tacks.

In quitting the port of Maranham, and proceeding thence northward, a favourable wind is required, and care must be taken, in order to avoid the dangerous shoal of *Manoel Luis,* described hereafter, and which lies as now represented on the chart. The combination of tide and current hereabout renders it necessary to be very circumspect when leaving the bay, or in sailing between it and the shoal of Manoel Luis, as the streams may be very variable.

In supposing the winds to be to the East, N.E. to E.S.E., which are the most frequent, you must take the starboard tack on quitting the roads, and then endeavour to steer so as to make good the route of N. ½ W.

It is requisite to get under way at the precise moment of high water; so that the first stretch or tack may carry you clear of the *Cerca Bank,* an approach to which may be known by a sudden change of depth, from 15 or 16 fathoms to 8 and even 5 fathoms, in the interval of time required for heaving out and drawing in the lead.

The *Cerca Bank,* situate in a N.E. and S.W. direction, is narrow. When on the northern extremity, in 9 feet at low water, the eastern side of the northern islet *Espera* appears in a line with Point Ataki, and the Point of St. Mark S. 56° E.

Beyond this, the first tack toward the west may continue, according to the wind and the tide; the ebb being still favourable. The latter sets, as already noticed, to the North and N.N.E. in all the extent of the bay, and one ebb may suffice for carrying the vessel out, provided it be taken, as recommended above, from the moment of high water.

Small vessels may approach the coast on the West, to the distance of two or three miles, but it is not prudent to advance so near in a larger vessel, or in less than 12 fathoms.

Having completed the tack to the depth prescribed, and hauled to the eastward, the depths will be found to increase, and it is probable that the second tack to the North will accomplish the passage outward; but, should it be otherwise, you continue to tack while the ebb continues; never lessening the depth under 12 fathoms, and taking every precaution not to approach too near the *Middle Bank*, which is steep-to. The velocity of the stream will be found proportionate to the depths; and the middle of the channel being deeper than the sides, it is, consequently, in mid-channel that the tide is most favourable.

Should the winds blow from the S.E. or S.W. quarters, at the moment of departure, with an appearance of duration, the most convenient route will be made along the Maranham side and the bank of Corona Grande; but the channel to the eastward of the Middle Bank requires caution. The leading mark to clear the eastern side of this bank is, the tower of St. Marcos S.S.W. ½ W. until the Morro or Mount Itacolumi bears N.W. by W. ¼ W., where you will be clear of its north end, and may proceed according to circumstances.

The pilot employed in conducting vessels outward is generally discharged at two or three leagues to the eastward of Mount Itacolumi.*

The only obstacle now to be feared and avoided, on the route to the northward, is the shoal of *Manoel Luis*, of which a description is subjoined.

SHOAL of MANOEL LUIS.—This dangerous shoal, which lies in the *true* direction of N. 8° E., 77 miles from the Point of Itacolumi, was first explored by M. Roussin, who ascertained its position, in 1820. It was previously known only by the number of wrecks which it had occasioned, and M. Roussin found it to consist in several groupes of conical rocks, even with the water, and separated by intervals unequal both in distance and in depth. Situate in a sea rarely exposed to violent winds, this reef breaks only in short intervals and at low water. It is, therefore, almost impossible to see it unless when passing very near. Nevertheless several rocks of the flat have over them not more than from 5 to 15 feet of water, with 8, 10, and 12 fathoms at their base.

The breakers, which rise instantaneously, have the appearance of the spouting of a whale, while the sea is smooth about them; and, when they cease, they leave masses of white foam, which continue for some time. When the sky is serene, the rocks may be seen under water, appearing like great black patches; but these are not visible until too near to be prudent for a vessel to advance to them. After two hours' flood, and only at half a mile off, with the sea smooth, no trace of them will be seen.

M. Roussin examined the shoal on the East, the South, and the West; and he pronounces that there can be no other danger hereabout, in these directions; but circumstances did not allow him to complete an examination from the North.

M. Roussin's observations, at 400 toises to the south of the westernmost rocks, gave for the latitude 0° 51′ 25″ S., and longitude 44° 14′ 35″ W. Variation 0° 57′ E.

The reef, which lies 0° 1′ 30″ East of St. Luis of Maranham, is more than half a mile across from North to South, and about three miles in an E. by S. and W. by N. direction. Should a vessel strike upon it, she would, most probably, go down immediately; as was the case with the *Venus*, of Liverpool, on the 21st of May, 1814, which ship unfortunately experienced this misfortune, and disappeared in about 12 minutes: the utmost precaution, therefore, is necessary, in order to avoid this danger.

By anchoring for thirty hours, near the edge of the shoal, it was found that the tide set regularly six hours each day, the flood to the S.W., and ebb to the N.E., nearly with the same strength, six-tenths of a mile an hour. High water on full and change at 5 h. The rise and fall was 12 feet. These remarks have been confirmed by others made by *Lieut. Lartigue*, in a vessel called the *Lyonnaise*, in 1826, who found the alternate streams to run at the rate of nearly a mile in the hour.

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* For a knowledge of the bank of soundings off the Bay of Maranham, the naval world is most especially indebted to a small but valuable chart, constructed by *Lieut. Geo. Crichton*, R.N., in 1813. Its contents, with a corrected longitude, appear on the chart which accompanies these directions, and render a more particular description superfluous. It may be seen that white sand, with black specks, is predominant all the way from below the parallel of Itacolumi, or 2° 15′ S. to beyond that of St. John's Island, or 1° 6′ S.

On the eastern part of the bank, upon coming from the eastward, the soundings are found more variable. Here are coarse sand, with bits of coral or pounded madrepores, broken shells, gravel, &c. all which correspond with subsequent descriptions.

The shoal of Manoel Luis was again examined on the 8th of December, 1828, by Capt. Geo. Cheveley, during a fine steady breeze, nearly East, and clear weather. This gentleman has said, The appearance of the reef, on approaching, is only that of a heavy sea, or rollers, hardly breaking in calm weather, and consequently the more dangerous. It is very steep, rugged, and composed chiefly of detached coral rocks. The shoalest part appears to have about 6 feet of water over it, the sea breaking, as it were, through gaps or little channels under water. The extent seemed to be about a mile and a half from East to West, and from half to three-quarters of a mile North and South. Latitude 0° 52′ 10″ S. Long. by chronometer, (Jackson, of Liverpool,) 44° 12′ 17″ : by another, (Hornby, of Liverpool,) 44° 12′ 40″; lunars, 44° 12′ 6″. The accordance of these results with those of M. Roussin, leaves no doubt as to the situation of the shoal.

VIGIA of M. DA SYLVA.—M. Roussin says that, in 1825, he was apprised of the existence of a groupe of rocks, said to have been discovered by *M. da Sylva*, an officer of the Brasilian Marine, and he enters largely into the question whether these may not be those of Manoel Luis. The position assigned to the Vigia of M. da Sylva is 0° 32′ S. and 44° 17′ W., and it consequently lies, according to this account, seven leagues to the northward of that of Manoel Luis. But we find that this Vigia of M. da Sylva has been laid down, in the same parallel, *at a degree farther to the west;* upon what authority we know not; and confess, with sorrow, that we have not more information on the subject.

MARANHAM TO PARA.

PARA or GRAND PARA is the northernmost province of Brasil, and is celebrated for its cotton, sugar, vanilla, chocolate, and coffee. The climate here is very sultry; the woods abound with valuable timber, of great solidity and beauty, and trees that yield odorous balsams. The capital, on the eastern bank of a great river of the same name, has a college, and commands all the adjacent country. The side toward the river is fortified with a number of gabions and large cannon; the other sides by a stone wall, about six feet high, and a dry ditch. The inhabitants are engaged chiefly in the cultivation and sale of cotton, sugar, and tobacco. Much of the cotton grows wild in the environs. *See, with regard to climate, &c. page* 4.

The coast, from the Bay of Maranham to Para, is generally low and sandy, but covered, more or less, with woods; it has many little isles, of the same description, with numerous coves and rivulets. Pimentel has described the whole, but his description is not adapted to the use of the modern navigator, unused to creep along the shore. Some of it may, however, be useful. A vessel, he says, bound from Maranham to Para, should take her departure in the morning, advance to the anchorage off the *Aracaji*, or cliff, already described, thence stand out to sea to beyond the shoals of Cuma, (or *Carnaveros Banks,*) which may be effected in a run of eight leagues. Having passed these you approach the sand-bank stretching from the western shore, and over which there are 6, 10, 7, 6, 5, 7, and 8, fathoms. Thus, you may proceed to the N.N.W. or N.W. by N., to the distance of 22 leagues, when the ground of the bank, white sand with black specks, will be succeeded by coarse sand and stones, or brown sand and broken shells, with 13 to 17 and 20 fathoms of water.[*] Here you will be off the Island of St. Joaõ, or St. John, and near the parallel of one degree south.

The island of St. Joaõ is nearly level with the sea, intersected with several creeks, and 8½ miles long, from N.E. to S.W. Between the N.E. end of this island and Point Turivazo to the W.N.W., the distance is about 9 leagues. The bay between affords shelter, and vessels may anchor off the N.W. side of St. John's Island, in from 10 to 5 fathoms, sandy ground.[†]

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[*] According to the later surveys.

[†] *St. Joaõ, or St. John's Island.*—There is anchoring ground in 9 fathoms, westward of the island, with the shoal off it E.N.E. ½ E.; the west end S. ½ E. There is a better anchorage at about a mile off shore with the Woody Point not open of a river to the northward of it. Here the tide runs very strongly N.E. and S.W. H.W. about 6 h. 24 m. *p.m.* Variation 1° 24′ E. 1832.—*(Hon. W. Wellesley.)*

At the distance of 15 leagues N.W. by W. ¼ W. from Turivazo Point is CAPE GUARAPI, over which is a mountain, insulated, and therefore remarkable. The mount is several leagues inland, and near it is another, somewhat smaller and rounder. The coast here, as in other parts, is, however, low, level, and sandy, covered with a dark brush-wood, and from the point a shoal, with breakers, extends three miles out to sea.

From CAPE GUARAPI to the RIVER CAITA, on the western bank of which is a small town of the same name, the distance is 16 leagues, on a course nearly West. At the entrance of this river, on the eastern side, are several low islets, of the same name. Off the shore, throughout this extent, the bottom is generally flat, and there is commonly 7 and 8 fathoms at three leagues off, with clear ground.

From the CAITA to the INLET of MARACUNO, the distance, W. by N. is 12½ leagues. In sailing along it is proper to keep two or three leagues off shore, in soundings of 7 and 8 fathoms. The coast here is distinguished by a range or chain of white sand-hills, the highest of which, *Pirausou Hill,* is about 3¼ leagues westward of Caita Point, the western point of the mouth of the Caita. Pirausou Hill appears like a high, bluff, and perpendicular, point, close to the sea, with red cliffs on its eastern side.

At 5½ leagues W. by N. from Pirausou Hill is *Point Atasia,* and immediately West of the point is the Inlet or Bay of *Maracuno,* having 5 and 6 fathoms of water, and good ground.

RIO PARA.—POINT TIGIOCA, the eastern point of the mouth of the Para, is 12 leagues West from Atasia Point: and within this, at the distance of three leagues to the S.W., is *Point Taipee.* Here an extensive bank (*Baxo do Boronco*) extends two leagues from shore between the two points, and to the northward are the *Braganza Bank* with the *Tigioca Shoals* and breakers, the positions and nature of which can be understood only by reference to the Chart. The passage in is between these shoals, and has a depth of 14, 12, 11, and 15, fathoms, at about 12 miles from the southern shore, in latitude 0° 23′ S. There is, also, a channel for small vessels, at 6 miles from shore, and along the edge of the *Baxo do Boronco,* the bank which extends from Point Tigioca, as already noticed.

From the mouth of the River, the distance to the Basin, or anchorage of Para, is 20 leagues. All the western side of the river is shoal, but, on the eastern side are even soundings of 8, 7, 8, 9, 10, 7, 10, 12, 9, 7, and 6, fathoms. In the Basin itself are from 5 to 3 fathoms.

A vessel direct from sea, with good observations, may cross the equator on the meridian of 45 degrees, where soundings, from 50 to 40 fathoms, may be found. A course hence, W. by S., will lead toward Maracuno Inlet, to the eastward of which a pilot may be obtained. The soundings over the bank decrease gradually, from 40 to 15 fathoms: and it is to be observed that the *flood-tide sets strongly to the west,* while the winds are from the east.

The flood sets into the Rio Para at the rate of four miles an hour; the beginning from the eastward is very rapid, and it veers gradually to the N.E. and North. The vertical rise is 10 feet.

VESSELS OUTWARD BOUND, from Point Taipee, steer according to the tide, keeping that point S.E. to the distance of 15 or 16 miles. With Cape Magoary then in sight, haul up N.E. or N.N.E., taking care to avoid the Banks of St. Rosa, on the west. The wind here being generally from the eastward, with frequent squalls, great caution is required. In thick weather, when Cape Magoary cannot be seen, the approach to St. Rosa's Bank may be known by the soundings becoming irregular, which is not the case to the eastward of the channel. The weather-shoals should be kept on board as much as possible.

DESCRIPTION, by MR. WEBSTER.—The great island MARAJO, which lies between the Rio Para and the main stream of the Maranon or Amazon River, is a low flat alluvial land, covered with brush-wood and grass, and abounding in cattle. This luxuriant island supplies Para with cattle and horses. In the rainy season it is much flooded, and is peculiarly unhealthy when the waters have quitted it and the sun begins to exhale the malaria. At this time remittent fevers prevail. It is overrun with alligators, snakes, and wild beasts.

The entrance of the Para is about 25 miles broad. The land on every side of the river is low; but the eastern shore displays a boundless continuity of shade, and one uninterrupted scene of forest green skirting the water's edge, and extending with one level surface to the horizon. The water is extremely muddy, but tranquil, and without the heavy swell of the ocean.

The navigation upward is intricate and dangerous, owing to numerous shoals and sandbanks, produced by the strength of the tide.

A rapid flood-tide sets upward, at the rate of between four and five miles an hour, and this flows with a current stronger than the ebb for seven hours, while the latter does not run more than four or five. The water at the town is at all times fresh, and may be used, although turbid. The rapid tide is dangerous to boats, in consequence of their liability to be drifted on to the cables and warps of the shipping.

The banks of the river are exceedingly muddy, affording but little facility for landing; and where they do allow of it, houses are generally erected. On the water are seen many thatched and cabined canoes of the country, and small river craft with lofty spindle masts and thin cotton sails, having some resemblance to Chinese vessels. It is not unusual to see them with a large mat, or a bush with all its leaves, to answer the purpose of a sail, in these canoes. The principal business of the river seems to be carried on in these canoes, which are continually arriving and sailing, and literally crowd the shore near the town. They bring the produce of the country from all parts, and come down the river from a distance of 600 and 700 miles. They are navigated by various native tribes, each canoe generally containing a whole family or more of people.

The city of Para stands on the right or eastern bank of the river, at about 70 miles from its mouth. As it appears from the anchorage, it presents nothing particularly attractive or conspicious, excepting its numerous churches, but, environed by wood and water, has altogether a humble appearance. The town, within, is dull and cheerless; the streets are unpaved, and filthy; but the shady walks in the environs form an agreeable retreat for its inhabitants. The shops and warehouses are numerous, and tolerably well supplied with merchandise. The markets are held by the water-side, where women, with vegetables and fruit congregate for most part of the day, but butcher's meat is not to be had after ten in the forenoon, a very salutary regulation, on account of the heat of the place. Nor can fish be depended on, in consequence of it, for more than three or four hours after it is out of the water.

The country in the immediate vicinity of Para is very beautiful, and the outlets to it are abundant. In the suburbs are several elegant little villas, with extensive gardens rich in all the variety of tropical produce.

Notwithstanding, however, the natural riches and superabundant advantages of Para, it is the poorest city in Brasil; and the various articles of produce are proportionally cheap.*

See further upon this subject Mr. Webster's narrative of the expedition of the *Chanticleer*, vol. ii., page 80.

REMARKS AND DIRECTIONS BY CAPTAIN THE HON. WM. WELLESLEY.

ON PROCEEDING FROM MARANHAM, *for the coast to the westward,* the courses are North and N. by W. until nearly on the parallel of the Island *St. Joaõ* or *St. John;* thence hauling to the westward the eastern part may be made. This land may be known by a small white patch of exactly the same colour as the *Lançoes Grandes*. It is very remarkable; for the surrounding country has verdure about it, and the sand is whiter, and has, altogether, a different appearance. At these Lançoes is a narrow passage between St. Joaõ and the main.

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* The Seranga or Indian-rubber tree abounds in the province of Para. It would be difficult to get a correct notion of the quantity of milk, or caoutchou, which might be obtained, or of the space occupied by the forests, but there are certainly from 9000 to 10,000 Indians employed in taking it. The trees are commonly 60 feet high, and from 18 inches to two feet in diameter, and entirely free from branches, or even knots, until near the top, when they branch out and produce a fruit. They grow indiscriminately amongst trees of all sorts, in the midst of a dense forest, and near swampy ground. For a long time after the milk was brought into general use for manufacturing purposes, the trees were cut down to procure it; for the Indians were not aware that, by the process of bleeding or tapping them, they might be made to render as much milk, and that this might be repeated yearly.

The common use to which the caoutchou is applied is for shoes, great quantities of which are taken to the American [Fredonian] market; the inhabitants of some states of the union being very partial to them. The town of Para, which contains a population of about 30,000, is curious only from the appearance which the Indian-rubber shops make in it. The shoes may be seen strung together by thousands, and of hues varying from the dingy yellow to the jet black, according to the length of time they have been hanging up. In all its different shapes, Para perhaps exports nearly 1500 tons of India-rubber annually. See upon this subject, the 'Nautical Magazine,' No. 37, March, 1835.

On continuing westward you lose sight of the Lançoes, and approach the eastern point of the isle, which is low and sandy. A shoal extends from it, which always breaks. This may be rounded in 9 or 10 fathoms. On approaching it, over the sandy ground, a green and woody point appears, which has a peculiar shape, from the trees at its extremity being withered or stunted. It may seem, at first sight, as if a mist were coming over the land. This should be known, because a certain sight of this point is requisite in order to take up a good anchorage. It should not be brought to the southward of East, and you should not open a river, the entrance of which is just to the southward of it. But a most preferable anchorage is found by rounding the breakers in 10 fathoms, then anchoring at about a mile from shore, in not less than 8 fathoms, and moderately close to them.

It is to be remembered, that navigators who are making the coast, and those who are leaving Maranham for the westward, should take three or four days after the full and change of the moon for the time of starting; as spring-tides run very strong; about four miles an hour. The Sapphire happened to enter the anchorage during their greatest strength, and upon the flood. Many of the shoals show only upon the ebb. The ship was driven upon their edge, and anchored in 7 fathoms, in a position presumed to be safe; but, when the tide turned, breakers were discovered within twenty yards, and had not then the wind and tide been favourable, she might not have gotten clear without difficulty. To anchor at St. Joaõ, take, if possible, the ebb tide and quartering of the moon.

At a hut to the southward of St. Joaõ dwells a Brasilian, who has the charge of cattle, the proprietor of which lives on the main land. Here fresh beef may be procured in abundance. The best landing is just round the south point. You may also land at Woody Point, and cut fuel; but if you remain there during the flood, you will hardly pull through the entrance of the river, the tide runs in so violently.

Between St. John's and Salina, a distance of about 50 leagues, the land is low.

From off St. John's the Sapphire steered N.W. by N. and N.W. until she had passed Cape Guarapi, which lies in latitude 0° 41′. The bay, on the west of this cape, is said to be not so deep as laid down in the charts, and vessels anchor mostly off the shoals. There are commonly a number of troops at Guarapi, and sometimes a Brasilian man-of-war. According to report there are diamond mines in the neighbourhood.

A good depth to run along the coast in, well off the land, is from 13 to 15 fathoms. Farther inward the depths decrease very gradually to 12, 11, and 10 fathoms.

POINT ATASIA, [*Atalaya Point*] is 25 leagues to the westward of Cape Guarapi. On passing between, Captain Wellesley has said, Until I arrived at *Mount Atasia*, the only points I distinctly made out were *Caita*, which is a long low green point, and *Mount Pirausou*, which may be known by the red cliffs about it; but you must be pretty close in to make the red out clearly. The directions in an old book say that Mount Atasia has a watch tower upon it, with a gun, which is sometimes fired when a vessel is seen approaching. This is not the case at present, whatever it might have been formerly.

Mount Atasia is rather a high point, with reference to the land around it: there are two or three remarkable patches of land on it; and from the eastward it makes very distinctly; as the point and white patches cannot be mistaken.

SALINAS, or SALINA, the pilots' station, is difficult to make out at 5 or 6 miles from shore; but as you open the land to the westward of Atasia, on looking carefully, a small white house will be discovered, with a red streak behind it. The white house is the chapel, and the red, the tiled roofs of the cottages. It stands upon ground rather more green than the surrounding country, and makes best on coming more directly from the northward, the whole village presenting a more enlarged appearance.

The best anchoring ground off this point is with the village bearing from S. by E. to S.E. by E., in from 7 to 13 fathoms of water. The Sapphire anchored with it bearing S. by W.

in 7 fathoms, off a spit which runs from Point Atasia; but here the ground was found to be foul.*

In sending a boat ashore, the best passage in is between two breakers, a little to the westward of the village: opposite to it is a very heavy surf.†

From Salina a W.N.W. course leads you to *Maranduba*, which is a white sandy point. From off the latter, the Sapphire kept to W. by N. and then to West, running in from 7 to 13 fathoms. When *Point Caracua* (a low green point which came in sight when Maranduba was on the beam) bore South, the *Braganza Breakers* were seen. These breakers always show themselves, and you may round them by the eye in 9 or 10 fathoms, proceeding gradually away from W. by S. to S.W., and then to S.W. ½ S. and S.W. by S. to run up the Rio Para.

In running up, *Point Taipee* should be noticed, with a small islet off it; for it is from this point that a departure is taken by the pilots on leaving the river.

Within the river, the *Bahia do Sol* and that of *S. Antonio* are the anchoring places preferred by the pilots going up or down the river. Other places are not so safe; for, owing to a foul bottom and grown swell, you may lose your anchor or snap your cable. The same observation applies to the coast in general. It is better, if there be sea-room, to stand off and on, than to run any of these risks.

Off Para it is best to anchor close to the town; the nearer you are, the deeper the water. The tide runs very strong, but the water being shoal, 30 fathoms on each chain is enough to moor by. The large mooring swivel supplied to her Majesty's ships is recommended to be used.

Fresh water is procured alongside, which is of good quality; but, being somewhat muddy, it should be strained through buntin in running into the tanks.

On LEAVING THE RIVER, the western channel is most commonly used. Having brought Point Taipee to bear from S. by E. ½ E. to S.S.E. the pilots steer North, which leads out clear of all the shoals. When you are clear pursue a North course, if possible, and you need think no more of the coast: but should the wind be foul, no immediate danger need be apprehended, if at from N.N.W. to N.E.; but in this event it will be better to anchor, should the wind be light and the flood-tide running.

On leaving the River Para you may expect a strong northerly current until you attain the parallel of Cape North, [or nearly 2° N.] It set the Sapphire for two days at the rate of a mile and a half in the hour. Afterward she experienced the regular *Equatorial Current*, setting to the north-westward.‡

Captain Courtney, R.N. has represented the bottom, along the whole line of coast, as being composed of quicksands, to which he attributes the frequent loss of anchors. Lieut. Stopford, who has frequently anchored on all parts of the coast between Maranham and Para, is, however, of a different opinion, but he admits that the quality of the bottom should always be ascertained before anchoring, because it is foul in many places.

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* From 7 fathoms, bad ground, Salina bore S. by W. ¾ W., Macussani W.S.W., Point Atasia [Atalaya] nearly South. The best anchorage is with the pilots' station S.E. in from 9 to 13 fathoms, and not less than four miles from shore.

† The PILOT-SIGNALS at the village of SALINA, in 1832, were as follow:—

1. A flag hoisted on the flag-staff is the day signal that a pilot may be obtained.

2. If the pilot should not, however, come off during the day, and at night there be shown two lights, the pilot may be expected off the following morning.

3. If there be three lights shown, the pilot has no boat, and must have one from the vessel to bring him off; in which case the vessel must bring the village of Salina to bear S.S.W., in soundings of 5 or 6 fathoms of water, when *Point Atalaya* (improperly called *Atasia*,) will be distant about five miles. You may hence despatch a boat, well manned, which must keep close in with the shore of Atalaya, clear of the surf, until it meets with an opening in the reef, which lines the coast in front of the village, through which it must pass. Inside the reef the water is quite smooth, and you may land any where upon the beach.

4. The boat should be sent at half-flood, in order that it may return by the same tide. It is high water here on the full and change, at seven o'clock, and off shore at eight.—*Lieut. E. Stopford.*

‡ *Nautical Magazine*, No. 19, 1833.

REMARKS MADE BETWEEN MARANHAM AND PARA, BY LIEUT. STOPFORD, COMMANDER OF H.M. SCH. PICKLE, 1832.

A vessel bound from Maranham to Para, during the rainy season, should get to the northward of the Equator as soon as possible: for she will thus avoid the light baffling winds and calms which prevail in this season; and also the current which sets from E.N.E. to S.E., about two or three miles an hour, augmented by the water from the various rivers and bays of the coast.

Westward of the Island of Salina are some white cliffs, so nearly resembling those to the eastward of that island, that they have frequently been mistaken for each other; and some vessels, after mistaking the western cliffs for those eastward of Salina, have stood on until they have been lost on the Braganza Shoal, or in that equally dangerous place, called the *Well,* on the east of the Braganza Bank. It is, therefore, indispensibly necessary that due precautions be taken for anchoring at Salina. With the town S. by E. you anchor in 9 fathoms.

The whole coast from Turivazo is woody, and the white sand-hills are very remarkable.

The *Pickle, when off Salina,* remained at anchor one night, in seven fathoms, with the town bearing S. by E., and had no difficulty in regaining her anchor in the morning.

Accidents have frequently happened here, and lives have been lost, by boats being swamped in the surf when going for pilots. To attempt landing immediately under the town is very wrong: boats should pass to the westward of the island; for, by entering thus, a river will be seen, which leads up to the town, and there, avoiding the surf outside, they may land in safety.

DIRECTIONS FOR PARA, by MR. RD. THOMAS, Commander of the brig *Margaret Richardson,* of Glasgow.†

[*The result of seventeen voyages.*]

When bound to Para from the northward, vessels should cross the equator in 46° W., then steer S.W. until they arrive in 28 minutes of South latitude: soundings may then be found in 17 and 20 fathoms; fine sand with small black specks. Steer a West course from thence, keeping the lead going, and do not approach the shore nearer than in 12 fathoms of water. The white sand-hills to the westward of the *Bay of Caita* will soon be seen, appearing from the mast-head like breakers, at the foot of high mangrove trees.

The land of Caita must not be approached, for the water is very shallow, and the soundings very irregular off the Bay, and the flood tide sets in to the West. By steering a West course, and keeping a good look-out, *Point Atasia* will soon be seen; it being the highest land on the coast from Mount Guarapi, with steep red cliffs at the end, and to the westward of it.

At about two miles farther to the westward is the village of *Salina.* The Pilot-station is situated on a steep cliff, and the houses covered with red tiles. A church, with the steeple, near the middle of the village, may be seen.

Abreast of this point, at the distance of about two miles, is a bank of hard sand and stones, with 4½, 5, and 6 fathoms of water; this bank extends to the eastward as far as Caita, and the west end bears South from Salina. Within this bank is a channel with 9, 10, and 11 fathoms of water, soft mud; but, being so near the shore, it is not recommended.

After having reached the pilot-station at Salina, should the weather be fine, with light winds, it is advisable to anchor, with the village bearing S.E., and in not less than 9 fathoms of water. For, should it come to blow during the night, which is often the case in the rainy season, and a vessel should part her cable, she will have sufficient room to make sail, and stand to the northward under easy sail until morning, and by that means will avoid the reef which lies off the island *Praia Grande*, the island next west of Salina. Should it be blowing strong on arriving off the Pilot-station, and past noon, the best way may be to lie off and on, under easy sail until next morning, for it would be too late to attempt to run for the banks.

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* Originally given in the *Nautical Magazine,* 1833.

In leaving Point Atasia for the Rio Para, make sail early in the morning, steering W.N.W. ½ W., keep the lead going, and be very cautious in steering and sounding, as the tides here run very strong, and are very uncertain in their direction, owing to the many small rivers and banks in the vicinity. A vessel should not advance nearer than in 10 or 12 fathoms, until she comes abreast of *Maranduba,* by some called *False Salinas.* The latter is the second island westward of the village Salina, and may be known by two white patches or sand-hills, in appearance resembling the sand-hills to the eastward, but smaller.* Having passed these sand-hills, continue a course toward the *Braganza Banks,* or breakers, still keeping the lead going.

Hence to the Banks, while in the fair-way, from 13, 15, and 17, fathoms will be found; and when the sand-hills bear about S.E. by E., the breakers will be seen from the mast-head on the larboard bow. These breakers must be left on the larboard hand, at the distance of about half a mile. The channel here, between the Braganza Banks and Tigioca Shoals on your starboard hand, is not two miles wide. Having reached the breakers, the only guide for entering the river, a vessel may steer a little more southerly, keeping the lead going; for she will then have, in mid-channel, 15 fathoms of water, with foul ground. Having advanced well round the breakers, the course thence up the river, will be S.W. ½ S., keeping the larboard shore on board.

SECTION IV.

The EASTERN COASTS *of* BRASIL, &c. *from* CAPE ST. ROQUE *to the* RIVER PLATA.

I.—THE COAST OF BRASIL, FROM CAPE ST. ROQUE TO PERNAMBUCO.

WE have already shown, in our former work, the Memoir on the Atlantic, that ships bound to India, and not intending to make the Northern Coast of Brasil, have frequently and unintentionally made the land near Cape St. Roque; that some have unexpectedly found themselves to the westward of Fernando Noronha, and that others have actually been wrecked on the Roccas, or Low Kays, situate to the westward of that island. Of all these the reckonings had been deranged by the WESTERLY or EQUATORIAL CURRENTS, which are found to prevail in this part of the ocean.

For the Winds and Seasons on this coast, in general, see the present work, page 1. For the Tides, page 7. For the currents, pages 8 and 9. For the passage to Brasil, page 14. For the Island of Fernando Noronha and the Roccas, pages 58, 61.

The WEATHER, &c.—The EASTERN COASTS of BRASIL, being almost entirely within the torrid zone, south of the Equator, are subjected to the general high temperatures of the lower latitudes; but the great diversity in the equalities of the ground, in the mountainous part of the country, produces a variation in temperature. On the sea, near shore, the ordinary state of the air is at 75 to 77 degrees of Fahrenheit's thermometer, from March to September, and of 77° to 86°, toward noon, from September to March: but, in different places, the temperature is higher or lower according to the localities; for instance, at the high town of *Bahia*, or *St. Salvador*, the mean expansion of the mercury has not been found, between September and January, in the warmest time of the year, higher than 75° in the morning, 79° at noon, and 76° in the evening. At *Pernambuco*, in the same season, (five degrees nearer the Line,) the thermometer has marked 83° to 84° toward noon, and risen, at times, to 87°: while at *Rio Janeiro*, nearly 10 degrees to the southward of Bahia, the prevailing heat is much greater, even at 91° to 93°. The difference is produced by the various heights and figure of the land.

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* These two sand-hills have, at times, been mistaken by strangers, and have proved fatal to many valuable lives, there being no landing in their vicinity. It was off this place that Captain Mann, of the brig *Warrior*, in 1827, unfortunately lost his mate and three men, by the swamping of a jolly-boat, when attempting to reach the shore in search of a pilot.

In the southern provinces the winter is rather severe; in the parallels of 27½° to 32°, or of the island of *Santa Catharina* and of the *Rio Grande de S. Pedro*, the snow falls abundantly on the high lands, and the hail, at times, greatly injures the plantations. More in the interior of the country, as the elevation of the land increases, so do the characteristics of winter.

The two seasons, dry and rainy, have already been described in page 4.

In reducing the seasons of the year to two divisions only, we conform, says the Baron Roussin, to the usual expression: but the diversity of exposures, the vicinity of mountains, and the various degrees of elevation in the ground, produce many local exceptions to the weather generally prevalent. At *Rio Janeiro*, for example, it rains much more in the last months of the northern monsoon, which generally is the dry season, than during the rest of the year: in November to March there are frequent storms in the evening or at sun-set, accompanied with thunder and heavy rain; these are quickly succeeded by a clear sky and fine weather. The cause arises from the disposition of the mountains which form the *bassin* or valley of Rio Janeiro, and to the great heat which prevails in it from the sun's diurnal passage,—toward and from the zenith.

By causes partly analogous, circumstances are similar at *St. Catharine's*, where storms and heavy rains have equally place during several months of the dry season; but these anomalies are limited to certain places, and do not affect, on the coast, in general, the characteristics generally assigned.

It may, therefore, be said in regard of Brasil, as of Europe, that the state of the weather depends on the situation of the sun in the ecliptic. In general, the weather is fine when the sun is in the hemisphere of the place; the contrary cause produces an opposite effect.

The worst months of the rainy season are marked by frequent fogs, extreme and continual humidity, and very heavy rains, which often continue for ten or twelve hours consecutively: and it has been remarked that, during the rainy season, the worst weather is at the time of new and full moon, more than at any other period.

It is at this time of the year that several maladies prevail, occasioned by the humidity; the heats which succeed produce lassitude, and it has been observed that the maladies are so much more heavy when there is little thunder during the passage of the sun to the equinox. In the bays and on the coast they consist, principally, in dysenteries, flux of a bad character, which, being neglected, if not terminating fatally, degenerates into obstructions, indolent tumours, and chronic affections of the viscera, to be healed only by change of climate.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
CAPE SAN ROQUE; summit of the cliff	5	28	17	35	17	12
Rio Searamirim; South point	5	41	0	35	15	30
Forte of Rio Grande do Norte	5	45	0	35	14	32
Point Negra; extremity	5	52	52	35	7	40
Point Gureo	6	1	49	35	6	22
Anse de Prinji	6	10	12	35	6	45
Point Pipa	6	12	53	35	3	42
Rio Cunhaó; Entr. South side	6	17	10	35	3	25
Bahia Formosa; South point	6	23	12	35	0	12
Bahia Traiçaó; North point	6	41	15	34	57	23

Point

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Point Lucena	6	53	35	34	50	28
Church of Santa Theresa	6	56	57	34	52	50
Fort Cabedello	6	57	30	34	49	50
Parahyba do Norte; Steeple	7	6	3	34	52	58
Cape Branco; Cliff	7	8	22	34	47	58
Nossa Senhora da Penha	7	9	0	34	47	30
Cliff of Point Guya	7	26	25	34	46	10
Rio Grande de Goyana; Entrance	7	30	40	34	46	30
Point das Pedras; Cliff	7	35	9	34	45	30
Rio Goyana; Entrance	7	30	44	34	47	0
Rio Ay; Fort at the Entrance	7	47	13	34	50	28
Nossa Senhorra Farinha	7	56	43	34	50	28
OLINDA; Western tower	8	0	59	34	50	40
PERNAMBUCO; Fort Picao	8	3	30	34	51	42
———————; Tower of Recife	8	4	7	34	52	37
———————; Tower of Boa-Vista	8	3	36	34	52	56
Freguezia de St. Antonio	8	8	8	34	53	52
Freguezia dos Affogados	8	6	16	34	54	0
Nossa Senhora do Rosario	8	9	18	34	55	44
Chapel in the Downs	8	18	40	34	58	5

MAKING of the COAST.—The aspect of the Eastern Coast of Brasil, between Cape St. Roque, in latitude 5° 28′, and the isle of St. Catharine, in latitude 27½°, varies considerably in its appearance. In the southern parallels, from the isle above mentioned to about sixty leagues to the northward of Cape Frio, the lands are very high, have many forests, may be seen, in clear weather, eighteen leagues off, and may be safely approached, with the ordinary precautions, on coming in from sea.

But this is not the case in other parts. Farther to the north the land declines in height, and can be seen at a moderate distance only. It must, therefore, be approached with caution. Such are the portions comprised between *Espirito Santo* and the *Monte Pascoal,* [Mount Pascal,] between *Porto Seguro* and *Bahia,* or the *Bay of all Saints,* between the *Tower of Garcia da Vila* [lat. 12° 32′] and *Cape St. Augustin,* and the following coast, nearly without exception, from *Olinda* to the North, N.W. and W.N.W., as described in the preceding section; whence it will be seen that, from shores of moderate height they decline to low sandy beaches, and so continue westward, with few exceptions to Maranham.

The warnings which may be acquired by soundings, in the proximity of land to which you may be approaching, depend on the part you may be on. These warnings may be of little service on the eastern coast; particularly between the Isle of St. Catharine and Olinda, as the bank of soundings extends to no long distance, and great depths prevail on its outer edges; the parallel of the rocks called the *Abrolhos* [18° S.] excepted.

The soundings give 62 fathoms at 18 leagues East from the island of St. Catharine; 45 fathoms at 12 leagues East from that of St. Sebastian; 32 fathoms at five leagues to the S.E. of Point Joatinga [lat. 23° 27′]; 70 at 18 leagues to the S.E. of the entrance of Rio Janeiro; and 68 fathoms at 7 leagues S.E. from Cape Frio. East of the last there are 35 fathoms at the same distance.

Between the parallels of 21° and 22° S. the depths, at 12 leagues from shore, vary from 40 to 17 fathoms. At 30 leagues East from Cape St. Thomé there are more than 100 fathoms. Soundings extend more to the East and S.E. of the Abrolhos, though but little to the eastward of the meridian of 37° 10′; which is 27 leagues to the east of these islets; and beyond this there is shortly no ground at 190 fathoms.

No bottom is found at 180 fathoms at only eight leagues to the S.E. of Cape St. Antonio, of Bahia; but, at nine miles to the south of this cape are 28 fathoms of water: again, at nine leagues, on the parallel of the Morro of St. Paulo, with the Morro in sight to the West, there is no bottom at the depth of 50 fathoms.

From Bahia to Olinda the bank is generally steep; at nine leagues to the East of the Tower of Garcia da Vila the depth is not less than 160 fathoms: at the same distance to the East of the inlet Itapicuru [lat. 11° 45′] the depth is 180 fathoms; it exceed-

170 fathoms at 20 leagues from Rio Real and Rio Sergipe, [or about 11° 20′ S.,] and it is found to be nearly fifty fathoms at ten leagues to the eastward of the mouth of the Rio S. Francisco. Finally, on all the coast, nearly to Pernambuco, there is found not less than 30 to 40 fathoms at nine leagues from shore; and at less than double this distance, on the parallels of Pernambuco and Olinda, there is not a depth of less than 110 fathoms.

To the north of the parallel of Olinda the depth comparatively lessens, but it is again very great at a little distance from land. There are found from 6 to 9 fathoms only at two or three miles from Cape Branco, before the mouth of the River Parahyba, and before the *Fort dos Reys Magos*, or mouth of the *Pontangi*; the same at four miles off from Cape St. Roque, deepening quickly to 40 fathoms, and thence continuing an increase to 10 or 12 leagues from the coast.

Hence it appears that, on a great part of the line of coast between the Isle of S. Catharine and Cape S. Roque the depths are, in general, either too great or too uniform to serve as a guidance, or to suffice for correcting an estimation of the route, to any particular spot. But it is not to be concluded that it is useless to sound on the coast; only observing that too much dependence should not be placed on the soundings at any distance from shore.*

The RECIFE, or singular ridge of coral rock, which borders the coast, has been noticed in page 62. It extends more or less, all the way from Point Toiro or Calcanhar (lat. 5° 6′) to the Morro of S. Paulo, lat. 13° 23′, and its intervals form the entrances to the ports of Rio Grande do Norte, Bahia de Traizaõ, Mamangape, Parahyba do Norte, Rio Capibarim, the two passages of Tamaraca, Rio Ay, Pernambuco, Santo Aleixo, Porto Tamandaré, Barra Grande, Cammaragipe, Rio S. Antonio, Porto Jaragua, Porto Francez, Sta. Anna das Alagoas, Rio San Francisco, Rio Vasa-Baris, Rio Real, Itapicuru, Bahia, &c.

It has been conjectured that this reef is based on debris brought from the coast by the constant repulsion of the waves; the debris being deposited as the waves become weak in the returning movement, or where a temporary stagnation, at a certain distance, was produced. The Recife, from its nature, acts as a breakwater, the water within it, near the shore, being tranquil. In these pools there is fishing almost throughout the year.

NATAL.—The first port of any consequence to the southward of Cape St. Roque is that called the Rio Grande do Norte, on the S.E. bank of which is the little city of Natal: the channel to this river is protected by the Recife, both on the North and South. This river, the *Pontangi* of the aborigines, is a rapid torrent in the rainy season; but in the dry season it is much reduced. A survey of it, up to the town, has been made by Lieut. Edm. Scott, R.N., whence it appears that the ends of the two portions of the Recife, forming the entrance, are nearly on a true East and West line from each other; so that the channel way faces the North, while the reefs are nearly in the same direction. The distance between the two extremities is about two cables' length, and the depths 3¾ to 6 fathoms. The depths within, and up to the town, 4 to 6 fathoms; but there are shoal banks within the reefs on both sides, while the mid-channel is clear. The town is about 2½ miles from the entrance, and there the breadth of the river is three-tenths of a mile, with an increasing depth of water.

A round fort, called the *Fort dos Reys Magos*, stands on the middle of the southern reef at the entrance; it is insulated at high water, but may be seen several miles off, and is the best mark. To enter the river, keep a fort on the main land, within the entrance, open of the extremity of the southern reef until the round fort on that reef is seen from the inside of it, bearing about S. ½ E., then run in S. ½ W. till the fort on the main bears W. ¾ S., and steer for it; when within two thirds of a cable from it, proceed toward a white house on the same side, and then directly for the town, in mid-channel, keeping over to the eastern shore, as there is a shoal bank all the way up on the opposite side.

The entrance of the river, according to the Baron Roussin, is in latitude 5° 45′ S., and longitude 35° 14′ 24″.

"A foreigner," says Mr. Koster, "who might chance to land first at the city of Natal, on his arrival upon the coast of Brasil, would form a very poor opinion of the state of the population of the country: for, if places like this are called cities, what must the towns and villages be? but such a judgment would not prove correct; for many villages, even of

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* For the *Treaties of Friendship and Alliance*, of *Commerce and Navigation*, between the crowns of Great Britain and Portugal, or Brasil, signed at Rio de Janeiro, 19th Feb. 1810, with some interesting Notes on the same, see Mr. Koster's Travels in Brasil, Vol. II. page 313.

Brasil, surpass this city: the rank must have been given to it, not from what it was or is, but from the expectation of what it might be at some future period. The settlement upon rising ground, rather removed from the river, is properly the city, as the parish church is there: it consists of a square, with houses on each side, having a ground floor only; the churches, of which there are three, the palace, town-hall, and prison. Three streets lead from it, which have, also a few houses on each side. No part of the city is paved, although the sand is deep; on this account, indeed, a few of the inhabitants have raised a foot-path of bricks before their own houses. The place may contain 600 or 700 persons.

"The lower town is situated on the bank of the river; the houses stand along the bank, and there is only the usual width of a street between them and the river. This place may contain from 200 to 300 inhabitants, and here live the men of trade of Rio Grande. The bar of the river is very narrow, but is sufficiently deep to admit vessels of 150 tons. The northern bank projects considerably, and from this reason it is necessary that a ship should make for it from the southward. The entrance to the reef, which lies at some distance from the shore, also requires to be known, so that altogether the port is a difficult one. The river is very safe, when once within the bar; the water is deep, and quite still, and two vessels might swing in its breadth; but it soon becomes shallow, and in the course of a few miles is greatly diminished. I should imagine that six or seven vessels might swing altogether in the harbour. The bars of rivers that are formed, as in this case, of sand, are, however, not to be trusted to, without good pilots, as they soon change their depth, and even their situation. When the tide enters, the northern bank is overflowed about one mile from the mouth of the harbour, and spreads over a considerable extent of ground, which, even during the ebb, is always wet and muddy, but never becomes sufficiently deep to prevent passing. A new road has been raised over this piece of land, which is about one mile in length."

At six leagues to the southward of the Rio Grande is the Ponta Negra, or Black Point, which may probably derive its name from several clusters of bushes, appearing of a dark green colour, in contrast with the white sand which constitutes the shore; several miles to the north of this are some red cliffs, which the pilots call *Barreiras de Infierno*, [Barriers of Hell,] and which extends in the direction of North, at some distance from shore. A rivulet *Conceiçao*, falls at the foot of them, through an opening of the Recife, before which breakers extend to about a mile. A dozen fishing huts may be seen at the mouth of the rivulet, and some small vessels in the inlet.

Bahia Fermosa, (or Fair Bay,) latitude 6° 12′, is nearly two leagues in extent, from north to south, and has, in the middle, 4 fathoms at low water; but having much foul ground, patches of coral with some rocks, and open to the sea, it is no safe anchorage.

The Ponta da Pipa, between Bahia Fermosa and Ponta Negra, takes its name from the shape of a wine-pipe. It is a rock on the point of land, upon which the sea breaks. To the N.W. of it are two villages.

BAHIA TRAIZAÕ, or Treason Bay, at nine leagues to the southward of Bahia Fermosa, has been heretofore described as the best anchorage on this part of the coast; but it is only a small cove, not possessing such advantages as have been described, and it offers no shelter against winds from between North and South by the East.

To the northward of the Bahia Traizaõ the coast entirely changes the nature of its aspect, and presents a continuous line of downs, of white sand, covered at intervals with bushes, and variegated only by several clusters of coco-nut trees. Hereabout the *jangadas*, or *rafts*, of the coasters, common to the southward, almost entirely disappear, as well as habitations on the beach; and all circumstances indicate the sterility of the country, and deficiency of population. Near this parallel commences the *Sertaõ*, a vast territory, extending to the N.W., noted for its sterility, and little better than a desert.

RIVER MANANGUAPE.—At a league to the southward of the Bahia Traizaõ, in the inflection of the coast, is the little River Mananguape. The coast between is distinguished by several small reddish cliffs. The river is a stream navigable by the coasters only; its south point is of sand, woody, very low, and it projects to the N. by E., terminating in breakers, on the north side of which is the entrance. On the north side of this entrance is a village, which may be seen from the offing.

RIO PARAHYBA.—This river, the largest in the neighbourhood, is a place of considerable trade. It entrance may easily be found by making *Cape Branco*, which lies 10 miles to the southward.

Cape Branco, is a projecting headland, in latitude 7° 8′ S. It is a steep cliffy shore, of white sand, which may be distinguished edgewise from North or South, but blends with the adjoining coast when in sight from the offing. Two remarkable coco-nut trees mark the extremity of the cape. At two or three miles from the land there are 7 or 8 fathoms of water, bottom of sand, oaze, and coral. The coast hereabout affords neither anchorage nor shelter.

From off Cape Branco the country to the N.W. appears like two plains, which, on advancing, become distinctly marked. The outer one, by the sea, is low and sandy, but woody in the higher part; the inner plain presents a line of small hills, wooded, and pretty in appearance. The River Parahyba flows between the two plains, and its direction is S.S.W. from its mouth, which is situated in latitude 6° 56′ S.

The south point of the mouth of the Parahyba is low, sandy, and woody, and forms the extremity of the first plain above described. The barrier-reef extends in front of this plain, at the distance of nearly half a mile. The north point is formed, on the second plain, by a more elevated coast; and on it are some coco-nut trees. On the height, to the N.W., is the conspicuous convent of *Nossa Senhora de Guia*, inhabited by the order of Santa Theresa. Extensive breakers indicate the mouth of the river; in front of which, at the distance of three miles, there are 10 fathoms of water.

Of the two points which form the outer entrance of the river, that on the south is called *Ponta Balea*, [Whale Point,] although the fishery for whales does not extend to the north of Bahia; that on the north bears the name of *Ponta Lucena;* these points bear from each other N.N.W. and S.S.E. 3½ miles: both are distinguished by extensive breakers.

On the shore within Ponta Balea is a low fort, *Cabedello,* which may be seen from the offing, when traversing off the mouth of the river, and it serves as a point of recognition for the low and even coast, which is destitute of other buildings. The bar is shoal, and dangerous to a stranger, and its best water, at low tide, is 2½ fathoms. Pilots come off and bring vessels to a roadstead off the fort, in order to be visited.

The city of Parahyba is about four leagues from the sea, but the sinuosities of the river make the distance six leagues. Vessels of 150 to 200 tons cannot proceed much above the Fort Cabedello, but small vessels go up to the town, and load with cotton, sugar, Brasil-wood, &c.

From a survey of this river, by the Honorable *Captain de Roos*, R.N., in 1832, it appears that the Fort Cabedello, on the eastern side of the entrance, stands in latitude 6° 57′, and long. 34° 50′. Variation of the compass 5° W. High water, on full and change, at 5 h. Springs rise 12 feet. The land-breeze is seldom experienced here.

The Remarks of Captain de Roos, as follow, were first given in the '*Nautical Magazine*,' December, 1833.

"The River Paraiba do Norte, which is situated sixty-seven miles north of Pernambuco, has an extensive commerce, and is generally visited by ships homeward bound from that port, to complete their cargoes. Vessels drawing 16½ feet water can safely enter at the springs.

The coast here trends north and south, and the direction of the river is S.S.W. nearly in a straight line. On the south point (Balea) of the entrance, which is low, sandy, and wooded, is built the strong fortress of Cabedello. The north point is also low, with coco-nut trees upon it; but immediately behind is some high wooded-land, on the point of which the remarkable Convent da Guia is distinctly seen. The barrier reef terminates abreast of the south point, when the bar commences, and continues till it reaches the extensive shoals which stretch out from Point Lucena.

Ships approaching from the south are recommended to make Cape Branco, which is four leagues south of Cabedello. It is a remarkable point, with two coco-nut trees on the very extremity. From the northward the latitude may be run down when Cabedello fort will appear. It is the only fortress for many leagues upon the coast, which otherwise bears a great sameness of appearance. Ships should on no account venture into less than six fathoms of water.

A gun fired will bring off a pilot: they come in jangadas from the Coco village to the south of the fort, and are considered expert and trustworthy.

The bar is at some distance from the land, and, as the passage is tortuous, it is not safe to attempt to enter without a pilot. On it there is eight feet of water at low water spring tides.

The bottom is sand, in some spots hard. There are breakers on either hand, and the marks which are given are difficult to distinguish, and therefore not to be depended upon.

The land winds are not of frequent occurrence. Vessels, therefore, have generally to beat out against the prevailing N.E. wind, which blows steadily. His Majesty's sloop *Algerine*, working out in October, 1832, made twenty-one tacks.

It is usual for all ships entering to anchor off the Fort Cabedello, in order to be visited: after this they are at liberty to proceed up the river. H. M. sloop Algerine was anchored with the fort bearing, by compass, S. 60° E., distant a quarter of a mile, in five and a half fathoms. Bad water and few supplies are to be found at this place.

A different pilot is appointed to take vessels up the river, which, as the wind is generally fair, is an operation of little difficulty or danger, and is almost always effected in one tide. The two shoalest spots are situated, one just above Cabedello, and the other abreast of the entrance of the Tambia river. Going down is tedious, as ships have beating winds, but the reaches are long. The bottom throughout is soft mud.

It is necessary to warp into the anchorage off the city, which is perfectly sheltered and secure. Indeed, the only vessel ever lost in the river was one which, by inadvertence, grounded upon her anchor, and foundered.

Water is to be procured by sending boats with casks up the rivers. That of the Tambia is celebrated for its purity. Provisions may be had in abundance, and at a very moderate rate."

The town of PARAHYBA contains about 3000 inhabitants. The principal street is broad and paved. The houses are mostly of one story, with the ground-floors as shops, and some have glass-windows. Here are six churches, and some convents, with several public fountains. The prospects from the windows present the finest Brasilian scenery; extensive and evergreen woods, bounded by a range of hills, and watered by several branches of the river, with here and there a white-washed cottage upon their banks, half concealed by lofty trees.

The lower town consists of small houses, and is situated upon the borders of a spacious basin or lake, formed by the junction of three rivers, which from hence discharge their waters into the sea, by one considerable stream. The banks of the basin are covered with mangroves, as in all the salt-water rivers of this country. The lands of the captaincy are rich and fertile, and the sugar is considered as equal to the best in any other part of Brasil.

The Coast to the southward of Cape Branco, and hence to the city of *Olinda*, has been very imperfectly described. The old charts and pilots represent an opening of the Recife, called *Porto dos Francezes*, at about four leagues to the southward of Cape Branco, affording occasional anchorage for ships, but on bad ground. Hence, southward, the Recife continues to the *River Capibarami*, or Goyanna River, in latitude 7° 30′.

The mouth or bar of this river lies nearly mid-way between the two points named *Coqueiros* or *Coco-tree Point* and *Ponta de Pedras* or *Rock Point.* Here the outer reefs extend to nearly a league from the land. It is said that vessels of 40 tons may proceed up the river to the town of *S. Miguel de Goyanna,* which is seven leagues up from the Bar.

The Points Coqueiros, or Guia, and Pedras, in latitudes 7° 25′ and 7° 35′, are nearly on the same meridian, 34° 47′, and they are the easternmost points of Brasil.

ITAMARACA.—This island, lying parallel with the coast of the main, is about eight miles in length from north to south. At its north end is a shallow and difficult channel, called the *Barra* or *Entrance of Catuama,* which admits nothing larger than boats and small craft, although in some part there is more than three fathoms at high water. At the south end, it has been said, vessels of 300 tons may enter, on a W.S.W. course, between the reefs, which extend outward 2½ leagues; but it must be with a fair or leading wind, as there is not sufficient space for tacking. In the channel, at low water, spring-tides, there is a depth of three fathoms, and the tide rises nine feet. The river, in the narrowest part, is a musket-shot in breadth; and, at this narrowest part, has a bank, which has a depth of 2½ fathoms over it, at low water spring-tides. Immediately above this bank is deep water, and so smooth that a ship may ride with any sort of cable. To this anchoring-place, from the bar, the distance may be about a league.

Itamaraca has been fully and pleasingly described by Mr. Koster.* This is one of the oldest settlements of the Portuguese upon the coast, and was given to Pedro Lopez de Souza, who took possession of it in 1531. In the year 1630, it had twenty-three sugar-works upon it; but, as a commercial station, it has fallen into insignificance. The island, however, is still populous, and has several pleasant villages, the inhabitants of which live much more happily than a stranger would imagine. The shores are planted with coco-trees, among which are thickly scattered the straw-cottages of fishermen: in some spots may be seen respectable white-washed dwellings, and there are salt-works on the island, which are one great source of its wealth; these are formed upon sands, which are overflowed by the tide at high water.

Mr. Koster says the harbour is good, and the entrance to it commanded by an old fort, which is much out of repair; the garrison is scanty, and without discipline. The entrance to the port is formed by an opening in the reef. It is readily discovered from sea, being immediately opposite to the channel or river into which it leads, and as there are breakers both to the northward and southward. Having entered, some small breakers will be seen a-head, or rather toward the south side of the channel, unless the tide is out, and then the water is quite still. The anchoring-ground is opposite to the fort, and on the outside of it; but opposite to the village of Conception (*N. Sa. da Conceiçao,*) which is farther in than the fort, there is considerable depth of water. Some parts of the ground are rocky, but others good.

Itamaraca has improved greatly under the auspices of a respected vicar, Pedro de Souza Tenorio, and a happy change has latterly appeared in society under his charge. When the people of colour now go to mass, if the family be in a respectable way of life, the younger females wear gowns of printed cotton, English straw bonnets, stockings also of foreign manufacture, and neat shoes made by the workmen of the country. The young men appear in nankeen pantaloons, and jackets of printed cotton, shirts of cambric muslin, hats of English make, stockings, and shoes. "Indeed of late years, since articles of dress have been cheap, and have come into general use, since a subject of emulation has arisen, and the means of showing it has been afforded, every hamlet sends forth its rival belles and beaux."

PAO AMARELLO.—The bar of **Pao Amarello**, or Yellow-wood River, is in the latitude of 7° 54′, long. 34° 49′ 55″. This little harbour is formed by a break in the reef, or *wall*, which here runs parallel to the shore, both to the northward and southward. There is a depth of 3 fathoms near the entrance, but it is a spot of difficult access, lying between the reef and the land; and is unsafe, because the channel is so narrow that it is necessary to ride with one anchor on the reef, and the other on shore, to prevent the ship's swinging with the tide.

The shore between this place and Itamaraca is composed of woody hills, cultivated, and separated from the sea by a beach of white sand, at two or three miles from which you may find from 10 to 14 fathoms of water, bottom of sand and gravel.

The coast hence southward to Olinda increases in height, and may be seen from a distance of 5 or 6 leagues.

On advancing to the Amarello, you may see on the beach a small battery, intended to defend the opening in the Recife. Vessels drawing 6 or 7 feet of water, which enter here, may proceed, with high water, hence to Pernambuco, by passing within the Recife and banks of Olinda.

At seven miles to the southward from Pao Amarello, is the **Point of Olinda**, in the parallel of 8° South. The navigation of the coast between is impeded by extensive reefs, as shown on the Chart. Ships coming from the northward should, in passing the Point of Olinda, give it a berth of three miles, keeping in not less than 10 fathoms; for within that distance the soundings may become irregular, and the reef in many parts is steep-to.

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* Those who wish for a copious and correct description of Northern Brasil, may be amply satisfied by the perusal of the two volumes by Mr. Koster, London, 1817.

PERNAMBUCO *and* OLINDA.

A good idea of the Road and Harbour of Pernambuco, with the coast of Olinda, may be gained from a reference to the survey of Captain Hewett, from whose pen have issued the following description and directions.

The CITIES of PERNAMBUCO and OLINDA are the principal places of trade on the Brasilian coast, next to Rio Janeiro and Bahia. The land in the vicinity is fertile and well cultivated; producing, principally, sugar and cotton. It is not of that elevated and grand description as the land about Rio, hereafter described, but it affords the most pleasing prospects, from the richness of its plains, and the numerous seats scattered in every direction. The summit of Olinda, on approaching the land, may be recognized at a distance of 5 or 6 leagues.

PERNAMBUCO.—The RECIFE, or REEF, of Pernambuco, which forms the harbour, runs in a parallel line with the shore, at about a musket's shot distance from Coconut Island, to the southward, to abreast of Fort Bruno to the northward. On the extremity of the latter is a small octagonal tower, called PICAÕ, and mounting seven guns: this tower assists Fort Bruno in commanding the immediate entrance to the harbour. Between the Picaõ and Fort Bruno is the harbour-bar, the greatest depth on which, at low water, is 10 feet, and is formed by an accumulation of sand, washed through a natural break in the reef, at a short distance from the Picaõ tower. This break has been frequently filled up by the Brasilians; but all their efforts to exclude the sand totally have hitherto proved ineffectual: so that the water on the bar gradually decreases in its depth; and the inhabitants, in consequence, are under the greatest apprehension of the harbour's being, in time, choked up.

Large ships discharge and take in their cargoes in a basin called the *Poço*, or *Well*, immediately at the head of the reef, and outside the harbour. The entrance to the latter is between some detached sunken rocks, apparently a continuation of the reef, called the GREAT BAR. It has on it 17 feet of water, which increases to 20 within, where the vessels moor. The inner, northern, and southern, sides, are formed by the gradual decrease of depth toward the shore, and are sandy.

Small vessels run over the Bar of Picaõ, called also the LITTLE BAR, which has 12 feet on it: the marks for it are, the two turrets of the southern angles of Fort Bruno in one. Over one or the other of the two bars, described, all vessels must pass to go into the harbour.

At the distance of a mile and a quarter E. by N. from the Picaõ tower, lies the body of the ENGLISHMAN'S or ENGLISH BANK, in length, from north to south, three-quarters of a mile, and in breadth, from east to west, half a mile. The shoalest water on this bank is 2 fathoms; the bottom is excessively rocky, as well as its neighbourhood. The marks for it are, a large coco-nut tree, distinguishable from all parts of the bay, and situated between the two most elevated houses on the hill above OLINDA, in one with a kind of jetty on the beach immediately under that town, and bearing N. ½ E. The cross bearing for the southern extremity must be taken by the compass, the Picaõ tower due west.

Between this bank and the Basin, or *Well*, is a passage of 5 fathoms, nearly half a mile in breadth.

In the offing, the bottom is composed of fine white sand; but, nearer the coast, numerous patches of coral are interspersed, dangerous to cables. *The best anchorage, for men-of-war*, is with Olinda North, and the Picaõ tower N.W., in 6 fathoms; as this is the only spot in the bay, near the town of Pernambuco, where they can lie, without the danger of parting in the space of three or four days.

Ships from the northward, on sailing in, should give Olinda Point an offing of three miles; never decreasing the depth to less than 10 fathoms; for, within that depth, the irregularity of the soundings may become alarming to a stranger. When abreast of Olinda, with the offing described, a S.W. course will reach the anchorage, clearing Englishman's Bank about a mile, and gradually altering the depth to 6, 8, 7, and 6 fathoms.

The LIGHTHOUSE, with *revolving* light, at the entrance of the harbour, was first lighted 2d Feb. 1822.—It stands about 50 yards from Fort Picaõ, on the point of the reef. The tower, octagonal and painted white, stands on a rock which is covered at one-quarter flood. The lantern exhibits three lights in succession, from sun-set to sun-rise, of which two are brilliant and the other *red*: these make one complete revolution in every two minutes, and may be seen from the mast-head, in clear weather, 20 miles off.

THE SITUATION of PERNAMBUCO was satisfactorily determined by Captain Hewett, in 1814, 1815. The tower of *Fort Picaõ* was given by this gentleman as 8° 3′ 30″ S. and 34° 52′ W.—Captain Cotesworth, commander of the *Creole*, a regular trader to Pernambuco, has since given us the latitude of the same tower as 8° 4′ 15″, the result of repeated observations: and he pronounces Capt. Hewett's longitude to be strictly correct. From the relative situation of Olinda Point, Captain C. makes its latitude 8° 1′. The Survey by the Baron Roussin, gives the latitude of the Fort as 8° 3′ 27″, and the longitude 34° 51′ 42″, —which confirms that of Captain Hewett.

CAPE ST. AUGUSTIN is a high, rugged, and projecting, promontory, which may be readily known by its red cliffs, with a church and barn on its summit. It has, also, on its eastern extremity, a battery mounting five guns, which is difficult to be distinguished at any considerable distance. The cape is described by M. Roussin as a hill lightly wooded, of moderate height, declining gradually to the sea: remarkable by the reddish cliffy spots on the termination of several points, by its arid aspect, and the church on its summit, with the battery to the E.N.E., intended to protect several small anchorages in the vicinity, but which appear to be no longer used.

By giving Cape St. Augustin an offing of six or seven miles, when bound to Pernambuco from the southward, and steering a N. by E. course, you will soon gain a sight of the city of OLINDA a-head, situated on the northern extremity of the bight which contains the HARBOUR and ROAD of PERNAMBUÇO. The city stands, principally, on the southern declivity of a pleasant hill; and, when the highest buildings are well in sight, Pernambuco will be discovered to the southward of them; the site being low and sandy.

DESCRIPTION *of the* INTERIOR *of* PERNAMBUCO, *&c.*[*]

PERNAMBUCO contains 60,000 people, and it carries on a great foreign and domestic trade. The coast near it is very low, and the country well clothed with woods, in perpetual verdure, which, contrasted with the white cottages scattered along the shore, the Indians fishing in their jangadas or canoes, and the beautiful serene sky, affords to the European, as he approaches it, a most pleasing prospect.

Many of the houses in the town are well built, chiefly of stone. The streets are wide and spacious, the churches are truly magnificent, and the images they contain are immensely valuable. It is supposed that the religious form one-eighth of the population; and of the continual crowd passing through the streets, they make no small portion.

Nearly one-half of the inhabitants are slaves, who are, in general, humanely treated, and make good and faithful servants.

The islands on which the town is built are connected by two bridges, one of which is a most beautiful structure, constructed by the Dutch, when they took this place from the Portuguese, in 1670. It consists of fifteen arches, under which runs a strong and rapid river, that comes many hundred miles down the country. On each side of this bridge are shops full of European merchandise, particularly English manufacturers, or, as they are called by the Portuguese, "*facendas Inglesas.*" It is in the middle only that a person finds he is on a bridge; he there beholds an opening, which, during the day, is often full of passengers, enjoying the cool refreshing breeze that comes down the river, and gratifying themselves with the prospect, which, from this spot is truly delightful. The river is seen winding up as far as Olinda, which is seated on a hill; on either bank, beautiful white cottages, intermixed with mangrove and coco-trees and fruitful vineyards; the Indians paddling down the river with their unwieldy canoes, the fishermen on the beach drying their nets, and nature displaying her gayest verdure, form altogether a *coup d'œil* which it is impossible to describe. The other bridge is a very long wooden one, in which there is nothing remarkable, more than its being quite open to the breeze which comes down the river. It is, on that account, much resorted to in the evening, especially by the English, who, seated on each side, often amuse themselves by criticising, with the characteristic liberty of their country, the numerous passengers.

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[*] Written, mostly, in the year 1811.

Most of the houses in Pernambuco are lofty, and, instead of glass windows, have green lattices, which have a pretty effect, especially as all their houses are white, and frequently surrounded with beautiful evergreens. All these windows are prominent, not unlike the Elizabethan windows seen in some of our old country towns. During the morning many of the inhabitants are seen leaning out of them, muffled up in their long cloaks, and exhibiting a genuine picture of indolence. The ladies are seen toward the evening only, peeping through the lattices; very few appearing in the streets, and then generally veiled.

Here are many good coffee-houses, which are known by a small round board, with *Cassa de Caffe* written upon it. The principal one is (or *was*) kept by a priest, and is the common resort of all the merchants, serving them as an Exchange. Good wine, sangaree, and a tolerable breakfast, can be procured here at all hours of the day. Here are also a billiard table and several backgammon tables, much frequented, especially on a Sunday, the day on which these amusements are mostly practised. At about eleven in the morning, the merchants make a tolerable show at this place, and much business is transacted. These merchants are, in general, rich and respectable.

The harbour of Pernambuco is wonderfully convenient. It is formed by a natural pier, extending five miles in a direct line. This is a coral reef so exactly straight and even, that one would almost imagine it the work of art. The vessels lie along-side each other in tiers, moored head and stern, at about half pistol-shot from the shore, and close to this reef, which at high water spring-tides, is nearly on a level with the surface of the sea, and forms an excellent barrier.

At Pernambuco the heat is excessive, the thermometer frequently being at 90° in the shade. During the night it is always calm, with much lightning. At about nine in the morning the sea-breeze comes gradually, and is strongest about noon, when by degrees, it dies away into a calm, that generally takes place toward sun-set.

The port is very well fortified in appearance, but it would make a poor resistance in case of attack. All vessels, on arriving in the harbour, are obliged to land their powder, which is conveyed by proper officers to a magazine, and returned on departure: but, while deposited, it is in general well tithed. The government raise about 5000 military here, comprising the militia; of these the greater part are blacks. The governor lives in great state.

Great numbers of the religious orders are always seen in the streets, dressed in their peculiar costume, and soliciting alms, for which purpose they carry a small square box, with the figure of Christ or of some saint painted upon it. It is to be observed that, although they consider the English as heretics, they do not scruple to receive their money; for which they kindly bestow, in return, a benediction.

In every street there are different images of the virgin and saints, which, on particular days, are exposed to view, superbly illuminated with a number of large candles. At about eight in the evening, the children in the neighbourhood assemble around them, and sing hymns. This has a pleasing effect, especially as they keep time with great exactness, and have a person to direct them by the ringing of a little bell. To a stranger, another custom, which is common in Catholic countries, appears very singular: twice every day, at about ten in the morning and seven in the evening, at the tolling of a bell, every thing is, at an instant, at a stand. Men, women, and children, whether in the streets or in the houses, instantly pull off their hats, cross themselves, and say a short prayer. This continues about a minute. At the second tolling every thing goes on again as usual. During this time a particular part of the mass is performing in the great church. The effect seems like that of magic, and the intelligent foreigner will, as a matter of course, treat it with respect.

The season of Lent is most rigidly observed, and that of Easter affords a perfect contrast. The religious procession, which takes place in the latter, with the illuminations, fire-works, &c., greatly surpass all that a native of Britain may conceive. Such shows are frequently repeated, and make a wonderful impression on the lower classes, especially on the slaves.

As Pernambuco is seated on very low ground, and quite surrounded by water, intermittent fevers are very common. There is only one hospital, which consists of a very large room, with about thirty beds on each side, filled with wretches suffering under the most loathsome diseases. A man stands at the door to solicit the charity of passengers, which contributes to defray the expenses. When a patient dies, he is laid on a table at the entrance, with a plate on his breast, to receive money for his burial. Four or five are frequently thus exposed at once. Great numbers of slaves die of the small-pox, fever, and dysentery.

The country, at a few miles from the town, is covered with thick impenetrable woods, dreadfully infested with wild beasts and reptiles, especially snakes, whose bite is fatal. The *ignis fatuus* or jack-a-lantern is very common here. It is visible mostly at twilight in the evening, and more than thirty exhalations of light may sometimes be seen at once. To describe this phenomenon is difficult. It has been compared to the very large sparks which fly from the forge of a blacksmith. These luminations rise from the ground, and continue to float in the atmosphere, at the distance of eight or ten feet from the surface, for some minutes, when they totally disappear.

The most beautiful birds abound in the neighbourhood, some of which sing delightfully. Macaws and parrots are very common, nearly every house having one or two at the door; and, as they often set each other chattering throughout a street, they make such a din, that an Englishman might imagine himself in a Welsh market.

The fishes on the coast are very numerous. The river near Pernambuco abounds with alligators, which are often very destructive; and that extraordinary fish the torpedo is frequently caught here. The electric power is so strong in this fish, that even the line which catches it conveys a slight shock. The blacks have a curious way of catching fish, which is thus performed: on a dark night they go on jangadas, (a sort of canoe composed of three or four long pieces of wood, lashed together,) on which they make a large blazing fire, which instantly attracts the fish, when they strike them with harpoons. Most of the fish with which Pernambuco is supplied is caught in this manner.

The CITY of OLINDA, at the distance of three miles N.N.E. from Pernambuco, is situate on a small hill, the summit of which is distinguished by a large monastery. The town is small; and though most of the merchants of Pernambuco have seats here, it is very thinly peopled. The houses are beautiful white buildings, interspersed with delightful gardens; rising as they do, one above another, on the side of a hill, they are seen a great way off at sea. The great trade and other advantages of Pernambuco, have drawn all the merchants from Olinda, and it now contains little more than two monasteries and a nunnery, with a few people dependent on them. One cannot imagine a more romantic situation, or one which commands a more lovely prospect than that of the monastery on the hill, especially of the church, which is the highest object on the coast, and therefore visible a long way off at sea.

Mr. Koster has said of Pernambuco, that the land is low, and consequently not to be seen at any considerable distance; "but, as we approached it we distinguished the hill upon which stands the city of Olinda, a little to the northward; and, at some leagues to the southward, the Cape of S. Agostinho; a nearer view discovered to us the town of *St. Antonio de Recife** almost a-head, with the shipping in front of it; the dreary land between it and Olinda, which is one league distant, and coco-groves northward, as far as the eye can reach: southward of the town are also seen great numbers of coco (not *cacao*) trees, woods, and scattered cottages. The situation of Olinda is the highest in the neighbourhood; and, though not very high, is still not despicable. Its appearance from the sea is most delightful; its white-washed churches and convents upon the tops and sides of the hill; its gardens and trees, interspersed among the houses, afford a promise of great extent, and hold out expectations of great beauty.

"A large row-boat at last made its appearance, doubling the end of the reef near the small fort, which was declared to be that which brings off the pilots. The *patram-mor*, harbour-master, in his naval uniform, likewise came on board. A large launch followed the pilot, manned chiefly by negroes, almost naked: the colour of these men, the state in which they were, their noise and bustle, when certainly there was no occasion for it, and their awkwardness, were to me all new.

"The pilot placed himself near to the ship's windlass; a Portuguese sailor was sent to take the helm, but still the vociferation was extreme; the man seemed to think that, by speaking very loud, he could make the English seamen understand his language; and, what with his bawling to them and to his own people, and their noise, the confusion was excessive: however, we doubled the fort in safety, and came to anchor in the upper harbour.

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* The outer portion of the city of Pernambuco. The middle part is called *Santo-Antonio*, and the ior or western part, *Boa-vista*.

The CATAMARANS, or *Rafts*, of the South-Americans, are commonly used for fishing, &c. at and about Pernambuco. They are made of logs of light-wood, secured together, with a stage at the after part; and are, at times, to be met with many leagues out at sea. For description and figure, see Steel's '*Elements and Practice of Rigging and Seamanship*,' two vols. 4to. 1794.

PARTICULAR INSTRUCTIONS FOR PERNAMBUCO, &c.

Having given above the general description of Pernambuco, by Captain Hewett, &c. we now add more particular instructions from the *Pilote du Brésil* of the Baron Roussin, annexing to the same those of a British officer, still more recent.

The *true* bearing and distance of Cape St. Augustine [Agostinho] from the Point of Olinda, is S. 17° W. (by compass S. 21° W.) 21 miles.

Cape St. Augustine is the point or landfall which vessels generally make when destined for Pernambuco during the southern monsoon. The coast to the north of this retires half a league to the west and forms a slender bay *(Gaybú)*: at 17 miles northward from the cape is the city of Pernambuco. The middle of this coast is marked by the chapel of *Nossa Senhora do Rosario,* built on an elevation about half a league inland, and having two towers or steeples, which facilitate a knowledge of the place on coming in from sea. The shore is low and covered with trees, nearly as far as Pernambuco; and, in coasting along shore, at from two to four miles off, there will be found from 11 to 17 fathoms of water, bottom of sand, with a mixture of broken madrepores.

After having recognized Cape St. Augustine, which is situate in lat. 8° 20′ 41″, long. 34° 56′ 34″, you may proceed to the northward, at two or three miles from the coast, until you raise the Fort Picaõ and Lighthouse, between the N.W. and W.N.W., then steering for the latter, it may be approached, according to the vessel's draught, until you bring the coco-nut tree of Olinda, standing between the two highest edifices of the city, nearly N. by E. On this bearing you will be at 700 or 800 toises (say three-quarters of a mile) from the Lighthouse, and you may anchor in 6 or 7 fathoms, bottom of sand, with shells and patches of coral; bad bottom it is true, but which it is almost impossible to avoid entirely in the Road of Pernambuco.

When coming to the port during the Northern Monsoon, it is proper to make the coast a little to the north of Olinda Point, which is in latitude 8° 1′ S., and longitude 34° 50′. From this point the coast, as already noticed, is bordered with a rocky shelf and breakers, extending outward about two miles, and should, therefore, be passed at the distance of three miles, in 8 or 9 fathoms, and until you bring the lighthouse and Fort Picaõ at several degrees to the north of west; thus avoiding the *English Bank,* a flat of sand and rock, above described, and over which the sea breaks in adverse weather.

The Road of Pernambuco is dangerous in such weather, as the swell is then very strong. The anchorage is on a rhomb to the west of the meridian of Olinda Point, at less than half a mile from the Kay or Recife of Pernambuco; and there is some risk of driving on shore with a strong wind from the points between S.S.E. and E.N.E., more particularly in the adverse season or southerly monsoon, March to September, when the winds are frequently violent.

The northern monsoon is, at times, not more favourable than the other to the surety of vessels which anchor here. Easterly winds are more frequent than those from the north, especially on the approach of new and full moons; and although, in this season, the weather is commonly fine, and the breezes weaker than those of the opposite season, it is requisite to take all precautions against accidents; and the first of these precautions is, not to anchor too near the land.

We have noticed that the bottom of the Road of Pernambuco is of bad quality; in fact, this anchorage, with a cable liable to be cut, offers no security; and vessels employed here should have iron cables: for the best serving or rounding would protect the others but very imperfectly from the effect of the great quantity of corals, madrepores, and lost anchors, interspersed over the bottom of this roadstead.

Vessels commonly moor E.N.E. and W.S.W., in order to have a long warp toward the offing, as well as to be more firmly situated and more ready for getting under way. It is prudent to have the sails and all things so disposed as to get under way promptly, should it be required. In the contrary case, drop an additional anchor in the evening, which you raise next morning.

Should you be obliged to remain some time in the Road during the southern monsoon, it may be convenient to have two anchors a-head toward the offing, and one anchor on the poop to drop toward the W.N.W., in order to hinder the vessel's drifting during the calm which often succeeds a squall. The last anchor serves to resist the land-breeze, which, however, is rare in this season; and not strong in the Road in any time of the year.

The Harbour of Pernambuco, formed on the coast by the *Recife* which borders the shore, is sufficiently large and deep for receiving a certain number of vessels drawing from 10 to 12 feet of water. This port, as already noticed, is divided into two parts. The first, or exterior port, is named the *Poço* or *Well*, and is, simply, an anchorage situate at the head of the reef to the north of the harbour. Its entrance is formed by several rocks or flats of detached madrepores under water, and which are probably a continuation of the principal reef. This entrance is named the *Great Bar*, and on it are from 17 to 30 feet at low water. Within it vessels moor with four fasts, the head to the offing. The ground of the Poço is of sand, and the depth decreases toward the shore. This place is open to the wind from the offing, and the sunken rocks at the entrance render it untenable during the southern monsoon. Its military protection consists in the Forts Bruno and Buraco, standing on the beach at 600 toises, or three-quarters of a mile, from each other.

The Harbour of Pernambuco, or *Port of Recife*, properly so called, is comprised between the kay of rock and the city, and is named the *Mosqueiraõ*. It has from two to three fathoms of water, and is sheltered from the sea by the Recife. In this place are from 8 to 6 feet at half-tide; but for entering they must pass over a bar of sand, on which, at low water, the depth is not more than 7 feet. This bar is defended by the *Forts Bruno* and *Picaõ*; built, the first on the beach, as already noticed, and the other on the extremity of the Recife, to the southward of the lighthouse. The distance of one of these forts from the other is three-tenths of a mile.

The marks for sailing in by the two passages leading into the port of Pernambuco are, 1st, for the Poço or Well, a small pyramid built on the beach, surmounted by a cross, and called the *Cruz do Patrao*, in a line with the church of *St. Amaro*, on the continent, which is surrounded with coco-nut trees. These are a little way up the country, and clearly seen. The bearing of the objects in one is nearly true West. But, before the leading mark is brought on, on approaching from the offing, you must avoid the English Bank, by observing the precautions already mentioned. From the Poço or Well this bank bears nearly East, less than a mile. Its shallow part is indicated by breakers. Having entered, you will see all the interior of the harbour, having the lighthouse to the south; and, by proceeding S. by W. [*S. ½ W.*] you gain the port of *Mosqueiraõ*.

2dly. Smaller vessels commonly take, on entering, the pass *immediately to the north of the lighthouse*, standing on the Recife; the direction for which, as before shown, is to bring the two southern turrets of Fort Bruno in one, and keeping this mark on, with 18 to 15 feet of water, until you see the western or inner edge of the Recife, with Fort Picaõ to the south, when you proceed along it until you have entered the harbour; and, having advanced to a proper distance, you make fast on the larboard side.

The city of Pernambuco is divided into three parts, in the direction of East and West, and separated from each other by the waters of the *Capiribe* and *Biberibe*, but connected by bridges. Pernambuco, the capital of the province of this name, is visited principally for its cotton, which, for its quality and superior preparation, is esteemed as the best in Brasil. The harbour is protected from the violence of the sea by the Recife, the lower parts of which have been raised to the level of the others, like a continued kay. This natural wharf shelters vessels in the harbour from winds in the offing, which are, at times, very strong, but they rarely cause damage to vessels well moored, though in a basin of small extent.

Navigators find at Pernambuco all kinds of succours. Here they may careen, re-mast their vessels, and repair all damages. They find, also, all refreshments and supplies of provision and ammunition; but at a price higher than in Europe. The water is good and easily procured, either at a little way up the Capibaribe, to the south, or at Olinda on the north, by means of the water-boats, which take it on board the vessels in the port or in the Road. Fire-wood only is comparatively dear.

The predominant winds in this road are those of the tropic, which may be said to blow generally from S.S.E. to N.N.E., with this variation, that, from March to September they approach more from the south (and sometimes even from S.W.) than in the other part of the year. In the latter season they prevail almost without interruption from E.N.E. to N.N.E.

The land-breeze, regular in the port, is very light in the road, and is rarely felt beyond the Recife, where the breakers always deaden it; but it weakens or lulls the first winds coming from the offing. The strongest of these, both outside and in the port, are from ten o'clock in the morning until five in the evening; that is, in all the day, during the absence of the land-breeze.

The temperature (before noticed) is commonly high at Pernambuco; especially during the night and until nine or ten in the morning: then, after several moments of calm, which are very oppressive, the sea-breeze, rising a little, reaches the coast and refreshes the air, until the moment of sun-set. Notwithstanding its heat, the climate of Pernambuco is considered as, generally, salubrious.

The tides are irregular in the port, probably because the rivers are affected by local circumstances, which increase or diminish the volume of water. The reflux or ebb is, however, perceptible after the sea has ceased to rise; and seems to accord with the lunar influence. The difference of level between high and low water is commonly 6 feet; but it attains 8 feet at the syzigies, and then the strength of the stream in the port is about two miles an hour. Under the latter circumstances it is high water at 4 h. 30 m. after noon or very nearly so. In the road the tides are always irregular, and the currents are determined by the prevailing winds at sea.

The variation of the compass near Pernambuco, in December, 1819, was 4° 48′ W. near Cape St. Augustine 4° 30′.

REMARKS ON, AND INSTRUCTIONS FOR, PERNAMBUCO, BY A BRITISH NAVIGATOR, 1835.*

Under favourable circumstances a ship from the eastward, bound to Pernambuco, should get into the latitude of the lighthouse, or 8° 4′ S. By night the revolving light will be seen, as already noticed. On approaching the coast the lead should be used; soundings may be gained at about the time the land is first seen from the mast-head, about 50 fathoms, sandy bottom.

On falling in to the northward of the port, the lighthouse not in sight, care should be taken not to run too far in, or into less than 20 fathoms, until day-light. The town of Olinda, being seated on an eminence, cannot be mistaken. On approaching it in the morning, from the eastward, its appearance is beautiful. Having Olinda in sight, with its churches and other large buildings, the next objects will be the lighthouse, Fort Picaõ, Fort Bruno, the shipping, and arsenal, in the port of Pernambuco.

You now bring the lighthouse to bear W.N.W., and run in upon that direction, thus avoiding the Olinda and English banks. You may anchor in 8, 7, or 6, fathoms, at one, two, or three, miles from the lighthouse, but do not bring this to bear more to the northward than N.N.W., as within this line the bottom is rocky, and there is a shoal at about a quarter of a mile from the reef.

To a stranger approaching northward of Pernambuco, it should be known that the land will appear verdant as far to the northward as *Itamaraca*, and no appearance of white banks of sand. When abreast of the north end of this island, three large coco-nut trees will be seen to the W.N.W. *Olinda* may be seen from the mast-head at the same time, to the S.W., and the white fort or battery of *Pao Amarello*, at seven miles to the northward of Olinda. Should the wind prevent a vessel from lying along shore on the larboard tack, stand off until midnight or morning, as the wind then is apt to blow at right angles with the shore, which will enable her to gain her port.

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* First given in the Nautical Magazine, No. 40, which is illustrated with beautiful views of Pernambuco and Bahia.

If falling in to the southward, about Cape St. Augustine, observe that the land is very remarkable, having ten or twelve coco-nut trees on its summit, and reddish banks of sand. There is, also, a large building among the coco-nut trees; but the most remarkable objects about this part are some white cliffs, about three miles to the northward of the cape. These cliffs are rugged and craggy, and appear like clothes drying at a distance. Olinda will be seen to the N.W.

Should a vessel fall in to the southward of Cape St. Augustine, a large mountain [*Monte Sellada*] will be seen, having the appearance of a saddle, and also two flat mountains, one on each side of the Saddle Mountain, bearing in a westerly direction.

The chapel on an eminence, *N. S. do Rosario*, with its two towers or steeples, between 7 and 8 miles southward of Pernambuco, has been already noticed.

The HARBOUR.—Pilots are generally in waiting to conduct vessels into the port; but, should none be ready, get the vessel (if at anchor) under way about two, or one and a half, hours before high water. Should the draught be not more than 16 or 17 feet, the *Small or Picaõ Channel* may be used. The leading mark through are the two south turrets of Fort Bruno in a line, as shown in Captain Hewett's Survey. This will lead within twenty yards of the rock lying to the north of the light-house: but as this rock is steep-to, a vessel may luff close round it, and keep close to the reef, if the wind permits, until within a cable's length of the lower tier of shipping; then drop the larboard anchor, and await the order of the harbour-master or pilots.

Large vessels discharge and load in the channel between the harbour and English Bank, at about three-quarters of a mile to the N.E. of the lighthouse.

Vessels lie moored in Pernambuco, with two anchors down, from the side next the town, and also two ropes or chains to the reef. Four vessels generally lie in a tier, and are sheltered by the reef, which is formed by nature, with the exception of a few stones which have been laid down a little above Fort Picaõ. The water within the harbour is generally smooth, except at the top of high water, spring-tides, when there is not only a heavy swell, but also a strong current rushing over the reef. In this case good ropes or chains should be fastened to the reef. This lasts about two hours only at each high water, during a few days, with spring tides.

On leaving Pernambuco, great care should be taken not to stand too near the Olinda Reefs, as there are some detached rocks about the outer edges. The greatest danger of coming in contact with these dangers occurs when leaving the harbour late in the afternoon, with a wind which prevents sufficient tacking. In day-light, however, there is little to fear, as the broken water can be seen; but, after the first tack, night may approach, so that the breakers cannot be seen; and also a strong northerly current according to the wind, which requires caution. The safest way, in this case, is to keep well to the southward.

The marks for clearing the Olinda Reefs, in the day-time, are the *Camona* or highest church, in the district of *Santo Antonio*, open to the southward of the lighthouse; or rather, the church with two steeples, lying a little to the north of the other, which leads a vessel more clear of them. By night do not allow the light to bear any more to the southward than W.S.W. until Olinda bears N.W. by W. or W.N.W., when a vessel will be at a good distance off shore.

Englishman or English Reef.—The centre of the bank or reef lies about E.N.E., one mile and an eighth from the lighthouse. The least water found on it was 13 feet at low spring-ebbs; the ground very rocky and uneven. To clear the bank to the northward, keep the highest church in *Boa Vista* open to the northward of the lighthouse. To clear it to the southward, keep the southern turrets of Fort Bruno shut in with the lighthouse. The marks from the shoalest part of the bank are the lighthouse and Boa Vista church in a line, and the largest coco-nut tree at Olinda in a line with an old decayed church, the lowest public building in the town.

This bank or reef is not so dangerous as it has been represented, excepting to vessels of large draught; for, when vessels are coming out of Pernambuco it is generally high water, when there is a sufficient depth over it. However, when tacking in the bay at low water, the former marks must be observed; as, also, when coming to anchor, give it a good berth to the southward, as with strong S.E. winds a very heavy sea sets into the bay. When at anchor too far to the northward, a vessel may drive on it before she could be brought up. The sea breaks heavy on the bank with the wind from this quarter, the same as on the Olinda and other reefs. On entering or coming out of the harbour with open boats, these breakers should be avoided, if possible, as accidents often occur by the boats' getting amongst them.

The pilotage in and out of Pernambuco is very expensive, although the pilots have no branch, yet it is customary for strangers to employ them, and even vessels trading to the port seldom refuse them. They are more serviceable in mooring and unmooring the vessel than in the service which they render in coming in or going out. They have generally a good boat's crew, and some of them are very expert in diving, to clear away any thing that may be foul of the anchor, a circumstance that often occurs; but there is one charge they make, which is for shifting the vessel down from the discharging berth to that of loading, which could be done without their assistance; still they force their service on you, and, under particular circumstances, a master is induced to take them.

Vessels loading a sugar cargo in Pernambuco should not load deeper than 14½ feet until they go outside. However, this greatly depends on the wind; for, should it be from the S.E. quarter, and a good breeze, there is little danger in going over the bar, when drawing 15 or 16 feet, on the height of spring-tides.

On leaving the harbour, vessels generally begin to unmoor at half ebb, the tide previous to their going to sea, when they have plenty of time to get all their ropes or chains in, and the vessel winded, deck clear, &c. Should the wind be from the S.E., a good breeze, get under way one hour before high water, keep at a proper distance from the reef, and make all sail possible; luff close round the rock that lies to the northward off the lighthouse, and observe whether the trees on Coco-nut Island, to the southward, open out to the eastward of the lighthouse; if they do, the rocks that lie to the northward of this channel will be passed to windward; then there is only the Olinda Reef to be regarded: but, should the direction of the wind be such that these rocks cannot be weathered, which can easily be seen by the coco-nut trees not opening to the eastward of the lighthouse, (or of the shipping in the harbour,) in this case these rocks must be kept on the starboard hand or passed to leeward, and therefore beat through the wide channel, as above directed.

It is to be observed, that all these dangers, being to the northward of the lighthouse, are nearly in a direct line with the main reef; so that, when the shipping in the harbour are open to the eastward of the lighthouse, a vessel is then clear of them to the eastward; and, by having them open to the westward, the vessel may run along with safety, passing to leeward of them all. Again, by keeping the shipping in a line with the lighthouse you would pass on the shallowest part of them.

Should the wind be so that vessels cannot lie along the reef, warping down becomes necessary; and before sail is made, they ought to be close down to Fort Picaõ. Masters, or rather pilots, not taking this precaution, often get to leeward, a circumstance frequently attended with danger, and which is sometimes fatal. This was the case with the brig *Alcides*, which was wrecked in 1832, abreast of Fort Bruno.

When ships are obliged to anchor outside, previous to their entering the port, which is generally the case, the masters usually go in with the boat, either to the Royal wharf, or else alongside of a visit boat, with one mast and flag, lying inside the reef, a little above the lighthouse. The cargo is generally brought off in boats, or large launches, and attended with very little risk, as the distance is not great, and not much swell. From this advantage, and the regular sea-breeze, the wall formed by nature, with its strong guns for mooring posts, that are proof against any accident that may occur, and the healthiness of the climate, this port may be considered one of the safest and best on the Brasilian coast.

Here it is high water, on the full and change, at half-past four. The vertical rise of spring tides is 8, and of neaps 5, feet. The highest tide is generally two days after the full and change.

II.—PERNAMBUCO *to* BAHIA, *or the* BAY *of* ALL SAINTS, INCLUSIVE.

Cape St. Augustin, with its trees, red cliffs, church, &c., have been already noticed in page 100. In the bay of Gabu, northward of this cape, there is anchorage within musket-shot of the shore, having a passage to it formed by the reefs.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude.			Longitude.		
	°	′	″	°	′	″
Cape St. Augustin; the summit	8	20	41	34	56	34
Rio Ipojuca; Entrance	8	23	2	34	58	24
Mount Sellada; Southern piton	8	25	19	35	10	56
Village of Maracay	8	29	26	34	59	30
A Chapel	8	30	36	35	0	58
Isles of San Aleixo	8	35	49	35	0	38
Rio Formosa; Chapel at the Entrance	8	39	40	35	4	34
Fort of Tamandaré	8	43	24	35	4	52
San Bento	9	4	56	35	16	49
Village of Quinta	9	16	18	35	22	37
La Forquilla	9	9	56	35	48	7
Porto Franceses; the point	9	39	45	35	41	11
Village on the Elbow of the Rio Alagoas	9	39	32	35	46	25
Morro of St. Antonio	9	22	17	35	34	57
Rio San Francisco; North point	10	28	15	36	22	40
———— ; South point	10	28	50	36	23	13
Mountains of Itabayanna; summit	10	47	10	37	23	10
Rio Vasa Barris; the Bar	11	11	0	37	6	0
Os Tres Irmaõs, or the Three Brothers	11	15	37	37	15	0
Rio Real; South point	11	28	4	37	17	50
Tower of Garcia da Vila	12	32	26	37	58	35
Rio Jacuipe; Entrance	12	41	52	38	6	15
Abrantes; Signal mast on the South	12	51	39	38	12	45
Itapuan; the signal mast	12	57	3	38	20	0
Rock of Itapuan	12	57	58	38	21	0
Itapuanzinho; the point	13	0	59	38	27	0
———— ; the flagstaff	13	1	3	38	28	55
BAHIA; the Lighthouse	13	0	45	38	30	44
Nossa Senhora de Bom Fim; the steeple	12	55	40	38	29	24
Nossa Senhora de Mont-Serate; the steeple	12	55	58	38	29	40
Piton of the Isle dos Frades	12	49	28	38	36	45

The total distance from Pernambuco to Cape St. Antonio of Bahia is 376 miles, and the mean *true* direction is about S.W. ½ S. Near the Road of Pernambuco the variation of the compass is 4° 45′ W., but it diminishes to the southward, and near Bahia is only 2° W.

The distance from *Pernambuco* to the *Point Meracahipe* is 30 miles, and the trend of the intermediate coast, *true*, is S. 15° W.

From *Point Meracahipe* to *Porto Calvo* is 44 miles, and the mean direction of the intermediate coast, *true*, is S. 27° W.

From *Porto Calvo* to the mouth of the *Rio Sibahuma* the distance is 248 miles, and the intermediate direction, *true*, S. 38° W.

From the *Rio Sibahuma* to the point of *Itapuan*, nearly on the parallel of the little *Mount Massarandupio*, is 47 miles; direction of the intermediate coast, *true*, S. 44° W.

From the *Point of Itapuan* to *Cape St. Antonio of Bahia* the distance is 10½ miles, and the mean direction of the coast, *true*, W. 15° S.

From CAPE ST. AUGUSTIN, southward, the coast continues to be fronted by the Recife and other reefs, and without which are gradual soundings to the distance of about two leagues. In coasting along, there may be found, in 15 or 16 fathoms, good anchoring ground, of white sand; the same ground may be found in 8 fathoms; but, in a less depth, the bottom is generally of rock and shells.

The POINT of MERACAHIPE, four leagues to the southward of Cape St. Augustin, is level with the sea, covered with wood, and, at a distance appears inundated. When at sea to the eastward of this point, you will, however, see an inland ridge of high ground, extending North and South, which has a break or dip in the middle, dividing it into two round knolls, and called *Serra Sellada, or Saddle Hill*, from its resemblance to a saddle. This mountain stands in latitude 8° 25′, longitude 35° 11′, and in all the country hereabout a similar one is not to be seen, nor one so high, all others being level, and covered with low brushwood. When just open to the southward of Cape St. Augustin this mount may be seen bearing W. by S. [*S.* 75° *W.*], and when in a line with Point Meracahipe it bears nearly N.W. by W. [*N.* 59° *W.*]

From *Cape St. Augustin* to *Point Meracahipe*, and still farther southward, the land is low, level, and covered with brushwood. The coast has a white sandy beach, bordered with a reef.

Above the point of Meracahipe is an hermitage, and between Cape St. Augustin and this point are successively the small hamlets of *Maracay* and *Gallinhas*.

The little islets of *St. Aleixo* lie in lat. 8° 35′ 49″, nearly off the entrance of the little river of Serenhen; at a league and a half to the southward of which is another little river, *Rio Fermosa*. The two islets in a line bear N. 60° W. *true*. There is no passage between them and the land, near to which they lie. To the N.W. of the islets, and at several leagues inland, may be seen the *Serra Sellada*, above described; and at several miles to the East of them Cape St. Augustine may be distinctly seen; as it bears from them N. 18° E. *true*, 16 miles.

Captain Monteath passed the islets on the 20th of December, 1825, at the distance of three-quarters of a mile; the soundings regularly decreasing from 12 to 10 fathoms, clayey bottom.

TAMANDARE.—At about three leagues to the S. by W. from the islets of St. Aleixo is the little *Port Tamandare*. It is against an opening in the reef which forms an anchorage, and which is larger than most of the openings of this nature. The space and the depth are sufficient for large vessels, and the coasters say that it will accommodate three or four frigates. The depths are from 4 to 6 fathoms. A fort on the coast defends the entrance and interior anchorage. The position of this fort is given by the Baron Roussin as lat. 8° 43′ 24″, and longitude 35° 5′.

The Roadstead of Tamandare is the best place for shelter between Pernambuco and Bahia, yet it is exposed to all winds of the segment from South to N.E. by E., and vessels are not protected from the sea by the reef; for it, in several places, is very little above the level of the water.

In proceeding along the coast, from N.E. to S.W., you pass successively before the bars of *Camaragibe*, *St. Antonio*, and *St. Antonio Mirim*, which admit jangadas only. On the parallel of 9° S. is the *Barra Grande*, and in 9° 11′ *Port Calvo*, where rivulets facilitate the transit of goods, but have no depth at the entrance.

PORTO CALVO is small, but will admit vessels of 120 tons, and may contain six of that description. Along the coast, at the distance of about half a league, is a ledge of reefs, having an interval which constitutes the entrance, and which has a depth of 5 and 6 fathoms. Within is a depth of 3 and 4 fathoms. Strangers must cautiously proceed with the lead, and will find, when within, that the water is smooth, with bottom of sand.

The name of BARRA GRANDE, given to an inlet situate to the N.E. of Porto Calvo, as shown on the Chart, may induce a stranger to suppose that it is a fine harbour. We have, therefore, to notice, that it has only three fathoms, with reefs to seaward, and a flat rock, covered with water. Its distinguishing mark is, the high land of St. Bento, on the south side, and above it the church of St. Bento.

From Porto Calvo to the Rio Camaragibe; three leagues to the S.W., the land is level, with low brush-wood; the reefs half a league from the coast; the beach of white sand. On the south side of the Camaragibe, stretching along shore, is a range of bare hills, or cliffs of red sand.

Near the river St. Antonio-merim (or Little St. Antonio) is a range of red cliffs, half a league in length, and three small round hills, which stand on its northern side.

MACEIO, or Maçayo.—The next place of any consequence on this coast is Maceio, or Maçayo, a village situate on the western side of a wooded bluff. Here the shore trends in an East and West direction, and upon it, to the south of the village, is a small fort near the mouth of a rivulet; before it is an open roadstead, protected on the east by reefs of coral, but which are covered at high water. The place has been surveyed by Captain the *Honorable F. F. de Roos*, R. N., who places the fort in 9° 40′ S. and 35° 41′ W.

There is a powder magazine on the wooded bluff east of the town, which is white, and may be seen at four leagues off. On advancing nearer, the church will be seen. The anchorage is good in 5 fathoms, sand and clay, with the town and fort nearly in a line, and bearing N.N.W. at three-fifths of a mile from shore.

The outer point, east of Maceio, is the *Ponta Verde*, or *Green Point*, which is covered with coco-trees, with breakers over its rocky extremity. To those approaching from the N.E. Maceio is hidden by this point; but, on rounding the reefs to the westward it comes in sight. At a mile from all this coast are found ten fathoms of water, bottom of madrepores, and the depth appears to increase gradually to the distance of 4 to 6 leagues, where there are from 25 to 30 fathoms; and in fine weather a vessel may anchor on almost any part of the bank.

To the northward of Maceio, far up the country, are seen the *Serras de Marambaya*, a chain of mountains discernible at 15 leagues off, and are conspicuous over the adjoining land, which has no distinguishing mark. The country here is very fine; the coast generally of sand, frequently covered with coco-nut trees, and small portions of a steep reddish shore. The middle of the mountains of Marambaya is in latitude 9° 25′.

The village of Juragua, amidst coco-nut trees, occupies the shore from the Fort of Maceio, abovementioned, to another fort at the distance of a mile to the east. The coast between forms a curve, and is very low. At a mile to the southward of the eastern fort is a *Baixo*, or detached shoal, which breaks with a high southerly wind. Good water may be obtained here.

It is high water here, on the full and change, at 4 h. 30 m. Spring tides rise 8½ feet. Variation of the compass, 4° W., 1832.

The following remarks on the port of Maceio, by the Hon. F. F. de Roos, were originally given in the *Nautical Magazine*, April, 1835.

" On approaching Maceio, when at the distance of twelve or fourteen miles, a small white building can clearly be made out. It is a powder-magazine, and is situated on a wooded bluff, which overlooks the town and harbour. The land may also be distinguished by a red spot on the face of the cliff, about five miles to the south-west, and by a white chapel, with two towers, in the same direction: moreover, Mount Barriga, at a distance in the interior, may be observed. It stands alone, and is higher than the land which forms the coast, but is otherwise not remarkable.

" Maceio being the only convenient anchorage between Bahia and Pernambuco, enjoys a considerable commerce, and has an extensive communication with the interior. Many English vessels annually touch here. Supplies are to be had at a moderate rate, and excellent water can be obtained in the adjoining harbour of Paijucara, at a well near the beach.

" The port is formed by the point of the Barrier Reef, terminating abruptly, which extends along the shore here, a sandy beach, forming the continuation of the coast for some miles to the southward. It is an open bay, but affords protection from the prevailing winds, which blow from N.N.E. to E.S.E. throughout the greater part of the year.

" The men who fish in the jangadas, or sailing rafts, which are constantly to be met with on this coast, are good pilots; but there is a regular harbour-master at the village of Jurugua, who will come off to bring ships, on their firing a gun.

"The anchorage of his Majesty's sloop *Algerine* was in five fathoms and a half, the end of the reef bearing S.E. and the covered wharf, or trapiche, E. 58° N., by compass. From this anchorage the sea is open from S.E. to S.W. ½ W., bottom sand and clay; a quarter of a mile in the direction of the trapiche are moorings laid down for the trading packets from Pernambuco and Bahia, which call every fortnight.

"Persons acquainted with the 'port generally approach it, keeping within a quarter of a mile of the reef, and in this manner rounding the point; but strangers are not recommended to do this, as the soundings are irregular, and the Baixo, with only fifteen feet of water on it, is to be avoided. The safe rule is not to bring the powder-magazine to the eastward of north, till you have passed the point of the reef; you may then haul into your anchorage.

"In the nine summer months this port may be deemed safe, but in June, July, and August, when the southerly winds prevail, it is very much exposed. No English merchant vessel has ever been wrecked here, though one brig, not long since, drove and bumped her rudder to pieces in a southerly wind. Instances of Brasilian wrecks frequently occur.

"There is an adjoining harbour, (to the East,) formed by the same reef, called *Paijucara*, which affords shelter to small vessels only. It is shaped like a basin, the entrance being near the centre. It is very shallow, and seldom used, as, with the wind to the northward of N.E. a vessel cannot fetch in. One corvette and two brigs of war have been built in Paijucara.

"The latitude, 9° 39′ S., is that given by Baron Roussin; the long. 35° 40′ 10″ W., is determined by applying the difference of longitude, 2° 48′ 19″, as measured by three excellent chronometers, to the longitude of Bahia. This is assumed to be 38° 28′ 50″, which is the mean result of occultations observed by myself in the year 1823."

In some Remarks on Maceio, by Captain Drinkwater, R. N., it is noticed that the land to the northward is of moderate height, abounding in red cliffs. H. M. ship *Doris* anchored in 8 fathoms, rock, and broke the anchor in heaving up three hours after. A little farther in the bottom is clearer, as seen by the sludge. A swell sets in continually.

ALAGOAS.—The Bar of *St. Miguel das Alagoas* (of the Lakes) is the mouth of a small river which comes from the N.W., and on the northern border of which is the little town of *Sta. Anna*. It is under this town that the coasters go to take charge of the sugar, cotton, and building wood, produced in the country and brought from the adjacent heights; several roads for the conveyance of which may be seen.

The Bar of St. Miguel admits very small vessels only. The same is the case with *Porto Francez*, a small anchorage at about two leagues more to the north, against the hamlet of *Ramedios*, and at the base of the *Point Massaveiro*, forming the south side of a large valley occupied by the River das Alagoas, and by the two lakes which give their name to that river. Craft drawing six feet may enter Porto Francez, the only point of communication from the lakes to the sea. The larger coasters stop in the exterior anchorage for receiving, by the jangadas, the merchandize of the country.

JIGUIA.—At five leagues to the south-westward of Rio St. Miguel, in about 10° 2′ S., is the Bar of *Jiguia*. The coast between is about 80 feet in height; nearly horizontal, and terminating on the sea by several reddish cliffs; the interior, which is woody, presents an agreeable aspect.

The *Bar of Jiguia* is not always navigable for the coasters, and they more frequently anchor outside; but, with high tides it allows the passage of the smacks, of 80 tons, built from the abundant wood produced on the sides of the river.

On proceeding southward from Jiguia you pass the mouth of the little *River Poxim*, on which is the village of *Conceiçao*; and at the distance of four leagues thence is the bar of *Cururippe*, off which, at the distance of about three miles, is a rock, named *Dom Rodrigo*, which is probably connected to the chain of reefs. On other parts of this coast you may approach to the distance of two miles, where there is generally from 10 to 13 fathoms of water.

The RIO SAN FRANCISCO is a broad and rapid river, but shallow, especially at its entrance. Pimentel says, that it is subject to great inundations in the months between September and March; and that, during this season, its current is so strong that it cannot be stemmed by an eight-oared barge. Small craft only can enter it, partly owing to the rapidity of its stream, and partly to the shoals at its entrance. The point *Manguinha*, at the mouth of the river, is situate, according to the Baron Roussin, in latitude 10° 28′ 50″, longitude 36° 21′ 15″.

The intermediate land between the Alagoas and Rio San Francisco is low and sandy; the shore bordered by the Recife, presenting small openings and inflections, known to the coasters only.

The entrance of the river is bordered on the south by the point Manguinha, a low flat point covered with mangroves. It projects to the E.S.E., and heavy breakers extend seaward a mile and a half. The north point, also very low, is of quicksand, without vegetation; the coast northward of it is of the same nature, and there are breakers as on the south. The passage in is between the breakers, and vessels anchor before it in order to engage a pilot, whose assistance is indispensible.

According to the pilots, the mouth of the river has a depth of 12 or 13 feet at high water. The country here is very populous, and abounds in sugar, cotton, building wood, tobacco, &c. The most considerable town of the vicinage is one called *Penedo*.

The Rio de San Francisco takes its source near the Villa Rica, about 80 leagues to the W.N.W. of Rio Janeiro; it is one of the largest rivers in Brasil, and is described as navigable in the greatest part of its course. It extends from the south to the north, in nearly a parallel direction with the coast; but traversing a flat country to the approaches of its mouth, it loses both depth and strength.

At about two leagues to the W.S.W. from the mouth of the Francisco may be seen a small opening on the shore, called by the country people *Barra Nova*. This is a discharge from the river during the wet season, but even then it is not navigable.

From the Rio San Francisco to the S.W. the coast continues to be very low; but we now come in sight of the great inland mountains *Pacatuba* and *Itabayanna;* the latter being to the west in about 10° 50′ S., and its highest summit is stated to be in 10° 47′ 10″ S. and long. 37° 23′.

Here it becomes dangerous to approach too near the shore, as with a strong south-easterly wind it would be difficult to gain an offing. The beach is flat, and the bottom near it of stiff sand, in which the anchors hold firmly: but this should not induce a vessel to come too near. At the distance of between 3 and 12 miles from land, the depth increases to 26 fathoms, with the exception of a spot 6 miles to the south of the Rio Francisco, where 36 fathoms have been found.

The RIVER COTANDIBA, which winds far up into the country between the mountains, lies on the parallel of 11° S. At a short distance within its entrance it receives the waters of several smaller rivers; but it has not more than 6 or 7 feet of water on the bar: nevertheless it is much frequented by the coasters, for the products of the country, as sugar, cotton, tobacco, &c.

When you have brought the Bar to the west, you will descry the Mount *Aracaju* at several leagues to the N.W., and to the west is the high land called the *Morro de Telha*. The first is remarkable from its form in the direction of the coast, with a cut or opening at its northern extremity: the second is in form of a cardinal's hat.

VASABARRIS, or RIVER of SERGIPE.—The Bar of the Vasabarris, or River of Sergipe, is ten miles south-westward from that of the Cotandiba. When advancing to this place, from the East or the South, you may see three small hills of equal size, covered with bushes, situate about three leagues to the S.W. of the entrance, and which are named *os Tres Irmaõs*, or the *Three Brothers*. The town of Sergipe, built at the foot of these hills, on a conflux of this river, has given its name to the stream.

The mouth of the river is formed on the south by a long point of white sand, and is, as well as the north point, encompassed by violent breakers, which render an entrance into it very difficult. Under the most favorable circumstances, the channel has only 10 or 12 feet of water. The south point of the entrance is in latitude 11° 10′ 30″, and longitude 37° 9′.

RIO REAL.—The mouth of the Rio Real is seven leagues S.S.W. from that of Vasabarris. This is a river which proceeds, in a long course, from the interior, and inland is divided into many branches. Seen from the offing the mouth presents nothing remarkable, but the breakers on each side. A strong current sets outward from the river.

The southern point, called *Mango Secco,* is an extension of a beach of white sand, called by the pilots the *Prancha,* or Plank of Rio Real. Within the bar the river turns to the S.W. and afterward receives a number of others. From sea, at about two miles off, are seen a number of huts in the environs of the bar; over the latter there are said to be only 15 feet of water, with high tides. The swell is heavy, and the passage always dangerous, and to be attempted only by the boats and pilots of the country.

All the coast extending from the Rio St. Francisco to the Rio Real is low, sandy, partly covered with bushes, and variegated with little woody hills. The ground without the *Recife,* or line of rock, is generally clean, and between 2 and 10 miles off the depths are from 9 to 30 fathoms, bottom of oaze, sand, and broken madrepores. The last quality of bottom is generally the farthest from shore.

ITAPICURU.—At seven leagues S. 30° W., *true,* from the Bar of the Rio Real, is that of the *Itapicuru,* which is of less consequence. According to the pilots it has only 7 or 8 feet over it with high tide, and it is obstructed by breakers, which render an access dangerous; no distinguishing marks being seen from the offing. On bringing it to the West, the opening may be seen between downs on the right and left, and there is a hamlet on the south side at some distance within the entrance. The only vessels which enter are the decked boats and jangadas or rafts of the country, which are insubmersible.

From the Bar of the Itapicuru the coast trends in a more southerly direction to and beyond the parallel of 12°. A series of small hills, called the *Oiteros de San Miguel,* borders the coast, commencing at 6 or 7 miles from the Bar of the Itapicuru. Nothing remarkable is seen on the coast for a distance of nearly twenty leagues, except the little mount *Massarandupio* in 12° 24′ S., eastward of which several rivulets fall into the sea. Along the greater part of the coast are the reefs, and a strand of white sand.

In the bay formed by the coast between the Rio San Francisco and the Rio de Sergipe, the sea, in all seasons, rolls violently inward; and more particularly when the wind sets in upon the coast. Many ships have been lost here; and as it is so dangerous, all who pass should keep off to a sufficient distance.

In latitude 12° 32½′, long. 37° 58½′, is the tower of *Garcia da Vila,* the most remarkable object of this part of the coast; it is a sort of fort, on the rising land, situate among trees, and having a signal-post. All the shore may be approached to the distance of a mile, in 11 to 14 fathoms, bottom of sandy oaze and broken madrepores or coral. The depths increase quickly, and at 10 miles off there is no bottom at 40 fathoms. In latitude 12° 30′ no bottom is to be found at 60 fathoms, 8 miles off.

From the tower of Garcia da Vila the coast trends S.W. to the point of *Itapuan,* on an extent of eleven leagues, and presents nothing but sandy downs, varied only by bushes and coco-nut trees. The Recife, or border of rocks, continues all the way, and many are always above water, appearing like islets: those, in particular, about Point Itapuan are seen detached from the coast. In this parallel, latitude 13°, at twelve miles off, no bottom is to be found at 100 fathoms.

The *Baron Roussin* says that, on all the extent of coast between the parallels of 10° and 13°, we have found that the winds of the northern monsoon have daily variations, a knowledge of which is useful to those bound northward. During the night the land-breeze ceases; but this is seldom felt beyond the reefs. On the approach of day, however, the breeze freshens and blends with the winds of the offing, which seem attracted by the north coast toward noon: after this hour the wind becomes more easterly, so as to make an angle of about two points of the compass between that of the morning and that of the evening. It follows that the borders are affected by these varieties, of which advantage may be taken.

BAHIA, *or* BAY *of* ALL SAINTS.

[BAHIA DOS TODOS OS SANTOS.]

From the Point Itapuan the coast trends nearly W.S.W., 11 miles, to Cape St. Antonio, at the entrance of *Bahia,* or the *Bay of All Saints.* This cape is distinguished by a light-tower, hereafter noticed. At 2¼ miles, East several degrees South, from the light-tower, is another point, on which is a lookout and signal station; this point is the southernmost of the promontory of Bahia, and it forms, with that called *Itapuanzinho*, at a mile more to the East, a small bay, or cove, occupied by an armaçaõ, and defended by the rocks. Some habitations are remarkable on the coast about the cape, but landing is difficult. Here the Recife or border of reefs terminates.

BAHIA, or BAY of ALL SAINTS.—DESCRIPTION of the BAY, TOWN, &c.—The entrance of the Bay of All Saints is formed, on the west, by the Island Itaporica, and on the east by the peninsula, on which stands the CITY of ST. SALVADOR or of BAHIA. Within it the land forms an extensive gulf or inland sea, bearing the name of *Reconcavo*, and which receives the waters of several large rivers. The entrance of the bay is seven miles broad, and the gulf within more than 32 leagues in circumference.

The situation of Bahia may be instantaneously understood by reference to the Chart of the harbour, which exhibits the anchorage, &c. Here fleets, riding on clear ground, may be sheltered from every wind, and surrounded by a country exuberantly rich, in a gulf which seems as if formed by nature for the emporium of the universe.* The whole of the land which composes the promontory terminating at Cape Antonio appears much higher than that on the opposite side of the bay: it is covered by trees and verdure; and may be seen, in fine weather, at the distance of ten leagues.

The Light-tower, on the western point of the Cape, is raised on the southern fort: its light is elevated about 120 feet above the level of the sea, but it is too weak to be seen at more than four or five leagues off. By day, on bringing it to the west, Fort St. Antonio appears to be separated from the land by a small interval.

At the Entrance, on the eastern side, the land, at a short distance from shore, rises steeply to a high ridgy hill, on the summit of which is the city, with the exception of a single street that ranges parallel with the beach; it occupies a large space, as already noticed, and contains some handsome edifices. It is built on uneven ground, interspersed with gardens, and is divided into the *Upper Town* and *Lower Town*, as shown hereafter, page 117. Next to Rio Janeiro, the city of Bahia is the largest and most important in all Brasil.

Many of the buildings are old and ill constructed, but, as in other catholic cities, the churches are distinguished above all other edifices. The cathedral is large, but falling into ruin; while the college and archiepiscopal palace, or house, adjoining, are kept in thorough repair. They were all, at the period of their erection, spacious buildings, and have a proud station on the summit of the hill, commanding the bay and surrounding country. The grand church of the ex-jesuits is, by far, the most elegant structure of the city. It is composed entirely of European marble, imported for the purpose at an immense cost. The college and monastery adjoining to it, which were the most extensive and best endowed of any in Brasil, having for the last forty years been entirely unoccupied, government has converted them into a commodious hospital.

Among the parochial churches, those of the Concession, Pillar, and St. Peter, are the most distinguished within the city, and those of St. Antonio and Vittoria near the bar, which stand in such striking situations as to form excellent sea-marks.

In the Royal Square is the house, or palace, of the governor, which is an old insignificant building; and opposite are the mint and public offices. The third side contains the court-house of the *relacao*, and the remaining one the hall of the senate and the prison. The latter is an extensive structure, of which the lower divisions are exceedingly strong and secure.

The custom-house and wharfs are on the beach, as is the dock-yard. Near the latter are the marine store-houses and offices, with the house of the intendant, or port-commander.

A few of the superior class of inhabitants have large elegant mansions, appropriately fitted up, particularly in the vicinity of the town. The habitations of other opulent individuals are generally roomy and convenient, but shabbily furnished: from the street they have a dull and dirty appearance, which is completely realized within. The houses of tradesmen and shopkeepers are commonly disgustingly dirty: instead of glased windows, they have wooden drop-lattices, which want even the addition of paint to enliven or preserve them. The lowest order of soldiers, mulattoes, and negroes, have tiled cabins, without a ceiling, and with a single latticed window. These and other buildings, with the exception of a street or two, are all intermingled throughout the city.

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* Lindley's Voyage to Brasil.

The town and shipping are protected by a number of forts and batteries. The first is that on Cape St. Antonio, a small antique fort surmounted by the light-tower. A little bay and sandy beach within are defended by a small fort, called *Fort Cabo* or *Santa Maria*, and the circular battery of *St. Diego.* At the S.W. extremity of the city that leads to the sea is *Fort Gamboa,* carrying 18 twenty-four pounders, which range at high water mark. Passing this, the dock-yard is defended by the high bulwark battery of St. Philip, which mounts about 30 guns. There are three other insignificant batteries on the inhabited part of the beach, and a small one on the projecting point, more to the North, called Montserrat. On the land side the city is defended by three forts, &c.

The principal defence, however, is the *Fort do Mar,* which was erected about the year 1600, on a small rocky bank of the inner bay, about one quarter of a mile from the shore. It was first built in a circular form; but, when the Dutch entered the bay in 1624, they were so greatly annoyed by it, during their attempt to gain possession, that they thought it deserving of additional fortifications, and they completed it to the shape that it bears at present; raising the original tower, and surrounding it with an extensive lower battery. The diameter of the whole is about 270 feet, and that of the upper tower battery 100. The lower battery mounts twenty-nine guns, of which there are a few that are forty-two pounders, and none less than twenty-four; the upper contains only sixteen, consisting of twenty-four and eighteen pounders. The tower ascends from the level of the lower battery about twenty-five feet: it is not a solid mass, but has several apartments, which diverge like rays from the centre to the exterior, and are employed as magazines for powder, artillery-stores, &c., and for barracks. The top of the tower is paved with flag-stones, carefully cemented and sloped, to preserve the rain that falls on its surface, which, collecting in the centre, descends through a grate into an extensive reservoir below, and affords a sufficiency of water for the garrison for six months without any other supply.

The house and offices of the commandant, and some rooms for state or military prisoners, are ranged on the lower battery, near the sloping entrance of the fort, on the side fronting the sea. This fort defends the marine arsenal.

The flagstaff of this Fort (according to M. Roussin) stands in latitude 12° 58′ 23″, longitude 38° 30′ 37″. Variation, in Nov. 1819, 1° 58′ W. High water on the full and change, 4 h. 15 m. Spring tides rise 7, neaps only 3, feet. The tides are perfectly regular. At the anchorage before the town the flood and ebb are equal, and their direction is alternately N.N.W. and S.S.E.; their strength, under ordinary circumstances, does not exceed a mile and a half in the hour, but spring tides sometimes run as much as 2½ miles.

The Fort do Mar, or Sea-Fort, otherwise called *Fort San Marcello,* repeats the signals of all vessels entering the port, which are first made at Fort St. Antonio. They are announced by a gun, with a tri-coloured jack for the three-masted vessels, a red one for brigs, and white for sumacks.

Ships, on arrival in the bay, (men of war excepted,) must deliver up all their gun-powder, to be deposited in the Fort do Mar, during their continuance in the harbour.

At the imperial dock-yard, ship-building proceeds very slowly, as it admits only one ship of the line at a time; but at the several private yards of Tapagipe, north-eastward of the city, well-modelled merchant-ships of all dimensions are built, and with greater despatch.

At about a mile from the city is the suburb of *Vittoria,* where Captain Sabine made his observations in 1822, and which he states to be in latitude 12° 59′ 22″, on a sand-stone cliff, which descends abruptly about 200 feet to the sea. The great road, by the coast to Pernambuco, and generally toward the northward, passes through the village.

The inhabitants of the city and suburbs are estimated at upwards of 100,000; of whom 30,000 may be whites, 30,000 mulattoes, and the rest negroes.

The commerce is very considerable. The imports from Europe are wine, flour, bacalhao, butter, cheese, salt, &c. The exports, cotton, sugar, aqua-ardent, (a species of rum,) coffee, tobacco, lignum vitæ, mahogany, satin and tulip woods, gums, balsams, and medicinal roots. From Africa, the Bahians receive wax and gold-dust, which are obtained in exchange for coarse printed cottons, spirits, and tobacco. The home or coasting trade of Bahia is likewise considerable and extensive; and in that between it and *Rio Grande de St. Pedro*, about forty vessels, of 250 tons each, are engaged. These ships, as they arrive in Bahia, sell the jerked beef, which they bring, by retail. It is purchased, principally, by the lower class of inhabitants, and for the use of slaves and shipping. This method of disposing of the cargo sometimes detains a vessel several months in the port.

In the immediate confines of the bay, particularly inland, the trade is very great; and it has been said that more than 800 launches and sumacks, of different sizes, are thus constantly employed. Tobacco, cotton, and various drugs, are brought from the *Cachoeira*; a great assortment of common earthenware from the *Iaguaripe*; rum and whale-oil from the island Itaporica; timber from the province of the Ilheos; farinha* and salt-fish from Porto-Seguro; cotton and maize from the Rivers Real and St. Francisco; and sugar, fire-wood, and vegetables, from all quarters.

Bahia, as well as Pernambuco, has a staple for cotton; and, on the importation of this article, in the launches and sumacks, the whole is landed at a warehouse appointed for the purpose, where it is weighed, sorted, and pressed. Its quality, first, second, or inferior, is marked on the bales, and then it is ready for exportation. In this general store it continues till disposed of by the owner, at the prices commonly fixed by the staplers. The aqua-ardent, or spirit, is controlled by an exclusive company, to whom every pipe that does not pass through its warehouses pays a duty increasing it to the price at which the company sells.

The general mode of conducting commerce has been by barter, notwithstanding the abundance of specie in circulation; and the inhabitants credit each other to a great extent; but, in their dealings, a mean and knavish cunning too frequently prevails, particularly when trading with strangers, of whom, they will ask, for a commodity, double the price they will take, while they endeavour, by every artifice, to undervalue what they are to have in exchange.

At Bahia are many artificers; including lapidaries, jewellers, gold and silversmiths, &c., who are deficient only in fashion and taste; also tailors, shoe-makers, and tanners.

The chief town of the province, next to Bahia, is Cachoeira, situate at the distance of about fourteen leagues to the N.W., in a delightful spot, on the banks of a small river. It is the mart for the northern gold-mines and the produce of the surrounding cultivated interior. Iaguaripe, Amoro Jacobina, Do Sitio, and San Francisco, are all bustling towns of the province. The country, in general, is cultivated inland to a considerable distance, and is divided into very extensive plantations, many having 200 or 300 slaves, with horses in proportion, to work the *engenios*, or sugar-engines, except in those situated where water is introduced to set them in motion. The owners of these plantations have very handsome seats, with chapels adjoining, where they generally reside, except during the winter rains, when they repair, with their families, to their houses in the city.

Of meat, mutton, lamb, and veal, are nearly unknown, and never seen in the market. The beef is generally very lean, flabby, and tasteless.

In all the city there is scarcely any accommodation for strangers. As an inn is unknown, those who choose to live on shore must take the whole or part of a house, and furnish it. This, however, is easily done, as a few chairs, trunks, and a table, will be amply sufficient, and in character. Eating-houses are distinguished by a tri-coloured flag over the door; but they are inconceivably dirty and disagreeable. The coffee-shops, which are numerous, are little better.

The city and country are alike very much infested with beggars; a subject of real or affected distress presenting itself every moment. Assemblages of these mendicants, to the amount of five hundred, may sometimes be seen at once.

Bahia has its comic theatre, which is little better than a barn, in a dirty situation. The actors, drama, and scenery, are equally despicable; the music being the only tolerable part of the performance. The chief amusements of the country are the feasts of the different saints, professions of nuns, sumptuous funerals, the holy or passion week, &c., which are all celebrated in rotation with pompous ceremonies, concerts, and processions. Scarcely a day passes on which some one or other of these festivals does not occur, and thus is presented a continued round of opportunities for uniting devotion and pleasure, which is eagerly embraced, particularly by the ladies.

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* Farinha is the Cassava flour, prepared from the root of the shrub mandioc. It is the bread of South America.

Bands of music frequently pass in large launches, playing in their way to the neighbouring villages on the bay, to commemorate the anniversary of some saint, or other festivity. It has, also, been a custom with the Portuguese European ships to have music on arrival, at departure, and the first day of taking in cargo; which sounds charmingly from the water. The musicians are all black, and are trained by the barber-surgeons of the city, who are of the same colour, and have been itinerant musicians from time immemorial.

Remarks from M. Roussin, 1819.—Ships will find at Bahia the means of providing for all their wants: they may careen, re-mast, and repair all sorts of damage; but the workmanship is very dear, and the port-dues extravagantly high, as in the other large ports of Brasil.*

In the fine season all kinds of repairs may be made at the anchorage west of the town; during the other part of the year it will be more prudent to make them at Tapagipe, in a little bay situate to the eastward of the peninsula of Montserrat, where the water is smooth as in a basin.

There are good watering places at many points of the interior coast of Bahia: water is easily obtained either near the *Fort Gamboa*, (south of the town,) under the public garden, or at some distance to the northward of the marine arsenal; but when a number of ships cause a great concourse of boats, it will be better to go to Tapagipe for water, if required in a great quantity.

Wood for fuel is abundant; and, in 1819, pit coal was obtainable, it having then been introduced into the country. Provisions and refreshments for shipping were easily obtained, nearly at the same prices as at Rio Janeiro; namely, cattle, farinha, and flour of wheat, rum, poultry, hogs, dried fish, tropical fruits, and vegetables.

An intelligent voyager, who visited Bahia, in April, 1824, describes it as follows:

I went on shore in the evening, and called, as is the etiquette, upon the British consul, who lives at *Vittoria*, in the Upper or New Town. This is almost an English settlement, and delightfully situated, with lanes, at least clean, if not trim, and gardens, or rather, shrubberies, to each house, down to the sea. The mango and other tropical trees, struck me with their rich leafiness, after the barrenness and dryness of Australian foliage. I found the white cedar, the *melia azedarach*, or common bead-tree of India, growing here, as well as at New South Wales; and I particularly admired the splendour of that species of acacia called *poinciana pulcherrima*, or the Barbadoes flower-fence.

The Lower Town of Bahia, in which the English merchants have counting-houses only, is very close and disgusting; rather from filth and the manners of the Portuguese than from the mode of building; for narrow streets insure shade, and declivity of ground commands the sea-breeze every where by its nature, and would command cleanliness with a very little art. There are many British merchants and shopkeepers settled here, corresponding principally with Liverpool. They are, as they are all over the world, the wealthiest and most respectable people in the place, and in favour with all parties, royalists, imperialists, and republicans.

The next afternoon I went on shore till my ship should sail, to enjoy the hospitality of my countrymen at Vittoria. I had no other claim to it than that of common country, but that was enough.

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* In the month of March, 1833, the brig *Arethusa*, Captain J. S. Boulton, on her return from Van Dieman's Land, was constrained, from want of water, to put into Bahia: and the captain says, On Saturday, the 16th of March, by our time (Friday, the 15th, by that of the country), we anchored in Bahia Roads; and, after *quarantine* till the evening, found the charges for anchorage, and schemes for detention, in order to augment those charges, truly disgraceful. In short, the expense of gaining twelve casks of water was £20 sterling. See the account of the *route of the Arethusa*, in the *Nautical Magazine*, August, 1833.

The weather favored our little *relache*, and our ship completed her watering on the 23d of April. I had, therefore, no time to visit the interior of the country, to which, indeed, there are no roads; but I perambulated the city of Bahia with great diligence, both in *caderas* and on horseback. The streets are too steep for carriages, although the hill on which the town is built is not 600 feet high, (as the books say,) but a little more than 200. The caderas, or curtained chairs, which are used as much by gentlemen as by ladies, are carried obliquely, with only one pole from the top of the chair on the shoulder of each of two negroes; so that each may see his way before him, and the sitter enjoy the thorough breeze and see before him too, if he chooses to open the curtains.

As it was the season of the Carnival, and this city was once the ecclesiastical metropolis of Brasil, we expected to witness the masquerading holydays of the Roman catholic religion. But the revolution had left priests at a heavy discount. We found the saint-cupboards in the streets shut up, and the carnival was forbidden by the governor, from fear of political riot.

On Sunday, the 25th, I visited the public garden in the fort of St. Peter, presenting a fine terrace to the sea. In the afternoon I re-embarked, with oranges and limes, though they kept not long, and pleased with Bahia, although I did not find it so musical and romantic as Rio Janeiro.

The climate of Bahia is not oppressive to a visitor; but it must be tiresome to a resident, to have the thermometer all the year round from 75° to 85°. Winter rains induce the lower degree, and the higher is always relieved by a sea-breeze.

The oranges of Bahia are particularly fine. They are seedless in the main core. The seeds are in a little perfect sub-orange at the top of the other, which gives the fruit somewhat of a pear-shape, with the seed-chamber divisions indicated in the rind of this little top-orange. The ant is a great enemy of this fruit-tree. Its armies will strip an orange-tree in a night. They surmount all difficulties. Fire at night is the only remedy.

The only manufactory at Bahia is of red pottery. The various water-vessels are peculiarly adapted to this warm climate.

SAILING DIRECTIONS for BAHIA.—Cape St. Antonio, at the entrance, is placed by the Baron Roussin in 13° 0′ 44″ S. and 38° 31′ 28″ W. Captain Sabine, in 1832, gave the longitude as 38° 33½′, but other authorities have given it more to the eastward, and the mean appears to be 38° 32½′ W.

Of the principal entrance to Bahia, the narrowest part is 4½ miles broad, but only one half of that space, (on the eastern side,) is navigable for large vessels, owing to ledges of rocks and uneven ground extending from the East and S.E. sides of Itaporica, and which should not be approached to less than 8 or 9 fathoms.

On the eastern side, without this entrance, is the *Bank of St. Antonio*, the outer extremity of which is 4½ miles S. ½ E. from the Cape of St. Antonio. This bank is composed of red sand, mixed with coral. It is of an irregular shape, but is narrow in proportion to its breadth, and it extends nearly north and south. The least depth on it is about 13 feet at low water. As the sea sometimes breaks over some parts of it in strong winds, it is always best to pass outside of the above distance in a large ship. The depth of seven fathoms limits this bank on the South in the parallel of 13° 5½′.

Between this bank and the shore is a channel having a depth of 10 fathoms, with muddy bottom, and frequently used: * but it is to be observed that, in going in, the wind almost always allows a vessel to fetch the anchorage before the town by one board, on passing to the southward of the bank. At one or two miles to the eastward of the southern point of the bank the depth is regular, from 35 to 20 fathoms, and which may be carried close to it.

The bottom, in the vicinity of the bank, is a mixture of sand, coral, and coarse gravel. Mud is found in the N.E. only, on approaching the land. At three leagues from the coast, with Cape Antonio bearing North to N.N.W., the depth is not more than 40 fathoms; and a little farther off, in the same direction, no soundings have yet been obtained.

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* This is a good channel, with a commanding breeze. It has been tried by several British frigates, and recommended as a short and safe passage into Bahia. Its breadth is three quarters of a mile, and least depth, on either side, 6 and 7 fathoms.

At the ENTRANCE of the HARBOUR the depths are from 14 to 16 fathoms, within half a mile of the eastern shore, whence it deepens to 18 or 20 fathoms westward, until about two-thirds across, farther than which heavy ships ought not to stand. To the westward of this are overfalls, shoaling from 14 to 6½ fathoms, then deepening again to 12; and, in some places, at 2½ miles from Itaporica, there are no more than three fathoms.

On the eastern point of Itaporica the reefs extend about a mile from shore; and, at about a cable's length without them the depth is 6 fathoms; it thence increases quickly to 12, 18, 24, and 26 fathoms, soft muddy bottom, and in the midway over is more water: from this, in an easterly direction, the depth gradually decreases to 12 fathoms, at a mile or a mile and a half from Fort do Mar.

The *Panella Reef is a spot of very foul ground*, about half a mile in length, from the centre of which the Fort do Mar bears E.S.E. ¾ E. three-quarters of a mile. It has, on some parts, only 3½ fathoms, at three-quarters ebb; on the other parts are 10 fathoms, rocky bottom. H.M.S. Nereus moored upon it in 7 fathoms, (being then unacquainted,) with Fort do Mar bearing East; Fort Cabo S. 5° W., and Montserrat Fort N. 15° E., and had her cables much injured.

There is good anchorage around this shoal: between it and Fort do Mar in 7 or 8 fathoms; without it in 12 or 14 fathoms; above it 8 or 9 fathoms; and below it, in the same depth, on good ground. Small vessels generally lie between the city and Fort do Mar.

The best anchorage for ships of war is in 10 or 12 fathoms, with Fort do Mar bearing N. 73° E., and Montserrat Fort N. 28° W., at about a mile and a half from the city. From this spot they will be able to get clear out, with the *very* light morning winds, as the ebb-tide sets strongly toward Forts Cabo and S. Antonio.

The *Watering-place* is at a short distance from the south end of the town, between it and Fort Gamboa: off the latter, a shoal extends along shore, and one-third of a mile outward. On this shoal H. M. sloop *Bonne Citoyenne* grounded in 1812: it has only 10 feet over it at three cables' length from shore, hard sandy bottom. The bastions of Fort Cabo kept just open of the slope of the hill, on which stands a convent with a *double spire* (nearly S. by W.,) will lead across the edge of the shoal in five fathoms.

Captain Horsburgh has said that, "This port is sometimes visited by outward-bound East-India ships in want of refreshments; but its situation being in the middle of the S.E. trade, navigators are cautious of touching here, thinking [that] they may find it difficult to get to the south afterward, on account of adverse winds, said (in some old books) to blow along the coast from the southward from March to September; but the East-India ships have never found any difficulty in getting from this port to the southward, even in the most unfavourable months, June, July, and August; for the wind generally draws well to the eastward here, and more so as you proceed to the southward."*

SHIPS DESTINED TO BAHIA, DURING THE SOUTHERLY MONSOON, should steer for the Morro of San Paulo, in latitude 13° 21′ 53″, and longitude 38° 54′. Although this morro is not of great height, it is sufficiently remarkable by being backed and followed to the northward by land lower than itself, and by having on its northern extremity five or six coco-nut trees, divided (in 1819) into two groupes, and very distinct in comparison with the surrounding land. The hummock which terminates this morro to the north, when seen from a short distance, presents on the side next to the sea large white spots, which form a striking contrast with the surrounding verdure, and which may, in clear weather, be seen at the distance of 8 leagues.

To the northward of the Morro of San Paulo the coast is low, sandy, and bordered with reefs: it forms a bay, and then, extending to the N.E., appears as if connected with the high land of Itaporica, on the west side of the entrance of Bahia.

The separation between the western side of Itaporica and the continent forms what is called the *False Entrance* of Bahia. It is very narrow, tortuous, shallow, and cannot readily be distinguished. It admits very small vessels only; for even the coasters do not use it unless when trading there, or when the wind will not permit them to use the principal entrance.

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* Compare with this the description of winds, on pages 1 to 5.

From the Morro of San Paulo to Cape St. Antonio the distance is ten leagues, and the direction N.E. In fine weather the two points are visible from each other. From near the Morro a ship may safely steer N.E.: a depth of 30 to 11 fathoms will be found on a bottom of mud, sand, gravel, and coral; and this course will lead at a convenient distance between the edge of the banks to the southward of Itaporica and that of St. Antonio. A large vessel should not go to the N.W. of this line, while to the southward of Itaporica; and if the wind blow strongly on the coast, she should keep outside until certain of being on the meridian of the point *Jabaru,* the east point of that island, which will be known by the depth being above 11 fathoms.

If necessary to work to windward, it will be adviseable to go no nearer than five miles to the coast of the continent, when to the southward of Itaporica, and to keep at the same distance from the island until Point Jabaru bears North. With this point bearing North and at seven miles from it, Cape St. Antonio will bear N. 41° E. *true,* distant five miles, and the south extremity of the bank, off the Cape, about a league to the eastward, and from thence a course may be shaped for the cape until within half a mile of its shore, and then another direct for the church of *Bom Fim,* on Montserrat, until abreast the Fort do Mar, near which is the ordinary anchorage.

Ships bound to Bahia during the northerly monsoon should endeavour to make the land at some leagues to the northward of the Point Itapuan, which has been described, (Page 113.) During the southerly monsoon they steer for the Morro of San Paulo, as described above.

The only precaution necessary to be taken by ships from the northward, in order to avoid the Bank of St. Antonio, is to give a berth of five miles to the cape, in rounding it, until it bears N. by E. ½ E., when they may steer for the church of Bom Fim (on the peninsula of Montserrat) until abreast of the Fort do Mar, or of San Marcello, near which is the ordinary anchorage. The depths in this course vary from 10½ fathoms, at a mile west of the Bank of St. Antonio, to 18 fathoms, at the same distance from the fort of that name. Afterward, closing the shore, the depths will diminish gradually to 9 or 8 fathoms, near the Fort do Mar. If, in making this route, the wind should prove contrary, some boards may be made, of 2 or 3 miles, between the bearing which connects Cape St. Antonio and the church of Bom Fim and the banks on the S.E. coast of Itaporica; but it will be necessary to keep the lead going on both tacks, and not to go into less than 7 fathoms.

The ordinary anchorage of ships of war is between West and S.W. of Fort do Mar, at the distance of from two to ten cables' length from that fort. From the anchorage, in 9 fathoms, the Point Maguinha of Itaporica bears N. 51° W., Fort St. Antonio S. 21° W., and the Point Montserrat or Monserat N. 12° E.

The great number of anchors lost here renders it necessary to round the cables, and examine them frequently.

The anchorage for merchant ships is within the line that connects Fort do Mar and the Point Montserrat. On going in, the Panella Reef must be avoided. The pilots place this shoal at 160 fathoms W. by N. from Fort do Mar, and on it, they say, there is not to be found more than 3½ fathoms at low water.

The best place within the anchorage for ships of war is opposite the obelisk of the public garden. Ships moor in a N.N.E. and S.S.W. direction, being that of the flood and ebb tides.

The prevailing wind is from East and S.E., with which ships may get in on one board. During the night the wind is from various points of the compass, and principally from the land side. The winds from South to North, by the East, which prevail most frequently, are always weakened by the heights under which vessels anchor, and the land winds seldom have any strength. In the southerly monsoons only, and principally in the months of July, August, and September, the winds veering sometimes to S.W. blow home into the bay, and cause a great swell, which is very incommodious, particularly at the change of tides: but these circumstances are of short duration; they occur generally at the times of new and full moons, and do not last beyond three or four successive days.

The Route for going out is the same as that for coming in, on the reversed direction. A vessel must run along the coast at the distance of half a mile to a mile, until she is abreast and to the westward of the lighthouse of Cape St. Antonio. In this track, from the Fort do Mar, from 8 to 18 fathoms will be found; and if farther off, a greater depth, even to 25 and 27 fathoms. Having arrived at one mile west of Cape St. Antonio, and steering S.S.W. 5 miles, the shoal of the cape will be passed in a good depth; after which a course may be shaped for the eastward.

III.—BAHIA *to* PORTO-SEGURO *and the* ABROLHOS.

The ISLAND ITAPORICA, opposite to St. Salvador, is enriched by numerous villages, delightfully situated. Its chief town is near the north end, defended by a strong fort, and has a brisk trade; it being the general mart of the island, and the rendezvous of all the launches passing through the inlets and creeks of this part of the bay. There are distilleries here, two churches, and an establishment for preparing oil from whales, which are frequently taken off the coast. Of the latter, many, at times, are seen, but few only are killed, in large boats, from the shore, to which the prizes are conveyed for boiling; but as the oil thus produced is by no means equal to the consumption, it is consequently dear.*

The channel between Itaporica and the main is navigated by small vessels, as we have already noticed, and a passage into All Saints Bay may thus be made, by the coasters, when the wind does not admit a direct passage to St. Salvador from the southward.

POSITIONS of the PRINCIPAL POINTS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Morro of St Amaro, in Itaporica	13	1	8	38	44	15
Knoll of Conceiçaõ	13	2	33	38	40	8
Point Jaburu, in Itaporica	12	57	36	38	34	40
Nossa Senhora da Penha	12	59	16	38	35	14
Point Aratuba	13	5	7	38	41	9
Point Caixo-Pregos	13	7	33	38	44	20
Morro of San Paulo	13	21	53	38	52	30
Hill W.N.W. from the same	13	19	27	38	56	0
Isle Boypeda; one of the summits	13	37	43	38	53	35
Isle Quiepé	13	50	58	38	55	0
Villa de Contas	14	18	6	38	56	32
Os Ilheos; the largest rock	14	47	23	38	55	0
Town of San Jorge dos Ilheos	14	49	25	38	56	15
Village of Unha	14	59	7	38	53	30
Morro of Commandatuba; the S.E. summit	15	22	8	39	3	33
Village of Commandatuba	15	25	20	38	52	22
Town of Belmonte	15	51	4	38	50	13
Santa Cruz; the steeple	16	18	50	38	58	0
Porto Seguro; steeple of the Cathedral	16	26	50	38	59	18
Nossa Senhora da Judea; Chapel	16	29	25	39	0	34
Monte Pascoal or Mount Pascal; the summit	16	54	8	39	23	25
Mount Joaõ de Liam; the summit	17	0	26	39	34	40
Mouth of the Rio Cramimuan	16	51	12	39	10	30
Colombiana	17	6	1	39	7	50
Villa Prado; flagstaff on the Fort	17	21	28	39	7	30
Paracel dos Paredos; N.E. point	17	56	45	38	47	30
ABROLHOS ISLES; North-easternmost Rock	17	57	27	38	35	50
————————; Largest Isle, Eastern summit.	17	57	44	38	35	54

The **MORRO de ST. PAULO**, in the parallel of 13° 22′, appears, at a great distance, like a high bluff rugged hill; but, on approaching, is found to be covered with beautiful verdure, and on its extreme point stands a neglected fortification. Passing this, the land forms a small deep bay, the water of which is transparent, and as placid as a mill-pond.

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* Lindley's Narrative, page 141.

The coast of the Island of St. Paul is bold; the town of this island is the capital of the presidio of St. Paul, but it is a miserable one, though delightfully situated. Here, also, are a fort and garrison.

RIO UNA.—On the N.W. of the Morro of St. Paulo the mouth of the *River Una* is nearly three miles broad, and forms a convenient harbour. Its western shore is low and sandy, and bordered by a sandbank, more than a mile broad on the outer part, but diminishing inward to a point, to 2½ miles W.N.W. from the Morro, where the river is about nine-tenths of a mile broad. On this line of direction the soundings, with clean and good ground, vary from 4½ to 5, 6, 7, 8, and 9, fathoms; with secure anchorage, sheltered by the high lands to the eastward, the Morro bearing about E. by N. a mile distant. The landing-place is half a mile within the Morro, on a small bay, within which is a village, protected by batteries, and having a red projecting cliff on the west. (High water at 3h. *p.m.*, rise 6 feet.)—*Capt. Chas. Eden*, 1835.

Without the Morro, on the S.E., is a low islet, *Tinharé*, 3 cables long from W. to E., and surrounded by foul ground, with breakers extending from it on the N.E. at 7 cables from the fort on the Morro Point.

The coast of Boypeda Island, southward of St. Paul's, is rocky and dangerous; particularly in the southern part called the Morrera Reef. At three leagues from the latter are other dangerous reefs, which extend far out from Ponta dos Castelhanos. From the wrecks which have occurred, Mr. Lindley advises that vessels passing should not approach the coast hereabout, within half a degree.

RIO CAMAMU.—Point Castelhanos is the north point of an elevated coast, whence it inclines to a low point, *Ponta da Muta*, off which lies, in the same northerly direction, the little isle *Quiepe*, surrounded by rocks. This isle, with the adjacent coast, form between them a small basin, into which falls the River *Acarahy*, distinguished by the little town of Camamu. Breakers impede an entrance into this bay, and prevent the access of all but small vessels.

The land of the Camamu, to the southward of Castelhanos Point, is covered with mangroves. Its termination may be known by a white rock (*Pedra Branca*) upon the south side of the *Rio das Contas*, a river accessible only by boats, in latitude 14° 18′.

The mouth of the Contas may be seen from the offing. Its south point is high and covered with trees; and, on nearing the coast, a small town will be seen.

From the Contas the coast trends S. ¼ W. ten leagues. All along it is perfectly clean, and large ships may proceed along it at the distance of two miles. The line of coast is broken only by several small creeks or mouths of rivulets.

St. GEORGE DOS ILHEOS.—The Fort of St. George dos Ilheos is situate on the south side of the bay of the same name, and appears like a part of the little town which is the capital of the province. Two remarkable islets lie off the mouth of the river, at a short distance to the east, and form with the coast a shelter for the coasters. A range of reefs extend to the southward, athwart the mouth of the river. Hence vessels proceeding to the latter must round the northernmost islet, (*Ilha Verde*,) off the western side of which they may anchor in 8 fathoms. The isles, at a distance, appear in the shape of cardinals' hats; one is covered with trees, and the other is bare, and frequently covered with breakers. The *Rio Ilheos* is large, but divided inland into many small branches. The town of St. George, immediately on entering the river, may be seen on the north side. On the bar is little more than 2 fathoms. The north point of the entrance is a high-land, called *Ponta de Caõ* or *Dog's Nose*, at the base of which are some rocks, over which the sea runs in breakers.

The latitude of the Ilha Verde is 14° 47′ 23″. At three miles to the east of it the depth is of 18 fathoms, bottom of oaze.

BELMONTE.—At the distance of 21 leagues S. 4° E. from the fort of St. George dos Ilheos, is the mouth of a river, the *Rio Grande de Porto Seguro*, the entrance to which may be known by the town of BELMONTE, a new and thriving settlement. This town commences on the south point of the river, and is masked by heavy breakers on shore to the right and left. The river is said to be one of the second order of the interior of Brasil, but has not more than two fathoms over the bar at high water. The province of Porto Seguro is bounded on the north by this river, which divides it from that of the Ilheos, or Isles.

The coast to the northward of Belmonte is straight, bold to, and uniformly woody, and may be approached with safety.* At from one to five miles from shore are found from 7 to 20 fathoms of water, over a bottom where oaze and broken madrepores predominate. At about 10 leagues to the north of Belmonte are the southern boundaries of the *Serras de Itaraca*, a groupe of mountains terminating the low lands which follow *Mount Pascoal*, or *Pascal* to the north. The southernmost of this group are the *Morros de Commandatuba*, where there is a small river of the same name, in latitude 15° 19′. Beyond the parallel of these mountains, the shore, variegated by hills, covered with trees, and small cultivated valleys, presents a very pleasing aspect, onward or northward to Bahia, or the Bay of All Saints.

PORTO SEGURO, &c.—From Belmonte, or the mouth of the Rio Grande, to *Porto Seguro* (latitude 16° 26′ 50″) the coast trends S. 15° W. 38 miles. It is covered with trees, which seem to lower gradually on advancing from the south to the north; and it is bordered, nearly to the distance of three miles off, with sandbanks and shoals, several of which are uncovered at low water, and dangerous to approach without a pilot. The banks are separated by the openings before *Santá Cruz*, *Coroa Vermelha*, adjoining, and *St. Antonio*, small establishments on the coast, accessible to small vessels of the country only, and unimportant to vessels of burthen.

The HARBOUR named PORTO-SEGURO is formed by a reef or ledge of rocks, that extend from a point of the main about a mile out, in a direction parallel with the land, forming a natural mole. These rocks are dry at low water, and terminate abruptly; appearing again faintly at the distance of half a mile; the space between is the entrance or bar of the harbour, over which there is a depth of 20 feet with high tides, but the depth within shoalens to 12 feet. The last may be considered as the average depth of the port. The bottom is of fine sand, gradually ascending to a broad beach.

On entering, the view of the country is delightful. Near the water's edge is a range of fishermen's cottages, shaded with waving coco in front, and each having its adjoining orange-ground. At the back of these cots the native underwood intrudes, and, intersected into numberless paths, forms ever-green groves, full of birds of rich plumage, and some of song. To the northward, the land rises to a steep hill, which is ascended by a winding path, leading to the town, which stands upon its summit.

Of the town, the streets are sufficiently broad, straight, but irregularly disposed. The houses are generally of one story, low, and ill-built, of soft clay bricks, cemented with the same, and plastered over. They are wholly destitute of glased windows, having only lattices of split cane, and appear dirty and wretched. About half a dozen are of two stories; the largest of which is a quadrangular town-house and a prison, the house of the civil governor, &c. The churches, of which there are two, have glased windows, and are, as usual in Brasil, the best buildings in the place.

On the banks of the river, below the town, stands a village of the same extent, containing about 400 cabins or cottages, and 3000 inhabitants, including slaves and Indians. These people are employed solely in the fishery about the isles and rocks called the Abrolhos. Fifty decked launches, or thereabout, are employed in this fishery, which keep the sea for a month or six weeks, until their cargoes are completed. The principal fish is a large one, of the salmon species, which is salted for the Bahia market.

Those who remain in town, and are not fishers, are employed in careening the launches, and making nets and lines. The latter are the best in the world; being composed of cotton well twisted, and then rubbed several times with the inner bark of a tree, which contains a glutinous resin that immediately hardens in the sun, and is proof against the effect of salt water. These lines are thus peculiarly strong, and yet elastic. Of the launches and cargoes the property is confined to a few individuals, who are comparatively rich; receiving returns for their fish in cash and necessaries of food and clothing, which are sold again to such of their poorer dependents as can purchase, for the generality are unable. Happily for the latter, they live in a fine climate, wherein no extremes of heat or cold distress the human frame, and where they can exist almost without clothing. Although fresh fish may be obtained in great quantities on the coast, the people are too indolent to procure them, and this article is dear and scarce. The common food is salt-fish and farinha, (the latter is about 3*s.* 6*d.* per bushel,) with oranges, bananas, and cocos, which fruits are in such abundance that they bear no price. English vegetables are here exotics; potatoes and cabbages are scarcely known, onions are imported from Europe or Bahia. Of beef only one beast is killed in a week, and that on Sunday; the prime quarters are then taken for the governor and officers of the town, and the remainder sold to the people.

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* The country hereabout is covered with extensive forests, and the trees are considered as the best for ship-building in Brasil. Hence, therefore, the government yards are chiefly supplied.

The principal inhabitants have each a country farm, mostly situated on the banks of the river, to the distance of five leagues from the entrance, and extending to a village named Villa Verde. At these are plantations of sugar, with mandioc for farinha. Poultry and domestic cattle are plentiful, yet the general diet is much the same as that in town, and milk is totally unused. With cultivation and industry, all the blessings of nature would abound here; while from misrule, on the part of government, and indolence on that of individuals, the greater part of the people exist in want, poverty, and ignorance of the best enjoyments of human life. The climate cannot be admitted as an excuse for want of exertion, for many weeks are as moderate as an European September, and the winter months are generally so; even during the hot days there are intervals of cool breezes, besides some hours of every evening and morning during which the sun's rays have but little force, and the ground is cool from the excessive dews which fall here.

The inhabitants plume themselves on the circumstance of theirs being the spot where Brasil was first discovered by Cabral, in March, 1500, and they preserve, with great veneration, the holy cross that was erected under a spreading tree at the first high mass, with music, discharge of ordnance, &c.

The Baron Roussin says, that the small river which falls into the port has, according to the pilots, only 18 feet over the bar at high water, and within are 11 feet: so that it cannot receive large vessels. Several banks, besides, extend to the offing, and it is dangerous to approach within two leagues without a pilot. At this distance are ten fathoms of water.

It is stated above that the town of Porto Seguro stands on the north side of the harbour. The land is scarped or steep, and the ascent to it is by a winding road, remarkable by its reddish colour, by which it may be known on advancing from the offing.

The fertility of the adjacent country offers many resources to vessels which may visit the port, and which may easily obtain water, wood, cattle, and all the ordinary refreshments of a tropical climate.

At the distance of two miles to the southward of Porto Seguro is the chapel of *Nossa Senhora da Judea*. It is very elevated, and its white walls, in contrast with the trees beyond it, form an excellent sea-mark. Its patroness, the *Madonna*, is particularly invoked by the neighbouring coasters, in cases of distress or contrary winds.

To the southward of Porto-Seguro, beyond the chapel of Nossa Senhora da Judea, is a small shallow bay, called that of *Trancoso*. Here are several plantations, and the country appears delightful. Farther southward, as shown on the chart, is the *Rio dos Frados* (River of the Fathers). The mouth of this is completely choked by a bar, and there is not a single plantation on its banks.

MONTE PASCOAL or *Mount Pascal*, in about 16° 54′ S. and 39° 23′ W. rears its circular white head, and is conspicuous to a great distance, serving as a pilot mark in the dangerous navigation to the Rio Caravelhas; for all along the coast hereabout is an assemblage of reefs, sunken rocks, and shallows; yet the neighbouring pilots conduct vessels so skilfully through, that few accidents are known.

From the Rio dos Frados, southward, to the *Villa Prado*, situate at the entrance of the Rio Jucurucu, is a long range of neglected coast, intersected by several small rivers, and frequented by such numbers of hostile Indians, that travelling on the beach is exceedingly dangerous, and never attempted without a guard. PRADO (lat. 17° 22′) is a thriving fishing town, but it is exceeded by Alcobaça, which stands more to the southward. The people of the neighbourhood employ themselves exclusively in the culture of farinha, with which they supply the port of Caravelhas.

CARAVELHAS or CARAVELLOS, in the parallel of 17° 42′ S., is the principal mart for farinha on this coast, and the place from which Rio Janeiro, Bahia, and Pernambuco, are chiefly supplied. A considerable number of sumacks, barks, and launches, belong to this port; which are built here, not only for its own use, but, also, for that of Porto-Seguro. The river has, however, a dangerous bar, that will admit vessels of twelve feet only; but, within the bar, there is a depth of ten fathoms. The river is two miles broad, and proportionably deep, and for six miles that it ascends to the town (S. Antonio), its banks are beautifully interspersed with plantations. The town is bustling and populous; the buildings are somewhat superior to those of Porto-Seguro, though in the same style; but the church has a miserable appearance. The country around is well cultivated with plantations of mandioc, from which farinha is extracted.

The Mount Pascal is the first remarkable mountain which is presented to view from sea on approaching from the southward; it makes part of a group of hills, extending nearly in a S.E. and N.W. direction, whereof the southernmost presents, at its northern extremity, a piton in form of a large square tower, which cannot be mistaken.

When seen from the east, Mount Pascal appears conical; at five leagues from shore it may be easily recognized from its elevation, and the heights surrounding it, which may be seen afar off.

The Itacolomi, an irregular assemblage of rocks and sandy banks, of which several are uncovered at low water, extend in a north and south direction, 11 miles, at a distance of five to ten miles from the coast.* Their extent is from E.S.E. of Mount Pascal up to its parallel. You may navigate and anchor between them and the land from the southern extremity to one half of their length; but the northern part is connected to the shore by a bar or bank of sand, which it is said leaves no passage. By keeping to the distance of 13 miles from the coast you will avoid all danger, and have from 10 to 20 fathoms of water. At 16 miles more to the east there are 80 fathoms.

As you advance to the land, north of the parallel of Mount Pascal, you may approach it to the distance of three miles, where the depths are from 10 to 22 fathoms, on a great part of the coast northward.

In proportion as you approach Porto-Seguro, on coming from the south, the cliffs appear more red, and the woods with which they are crowned have an admixture of coco trees, a sort of tree seldom seen more to the south. In proceeding along you pass successively before the entrances (hardly visible at four miles off) of the Cramimuan, Joasima, Frados, the little bay of Trancoso, and the chapel of N. S. da Judea, described above, as an excellent mark for the port.

PRADO.—The coast from the parallel of Mount Pascal to the *Villa Prado* trends S. ¾ W. It is low, woody, and uniform, as it likewise continues more to the south; but it is distinguished by its low cliffs of tufa or sand-stone, of a reddish colour, which form the shore; a few heights in the interior of the country may be seen; less elevated, however, than Mount Pascal, and still less toward the sea.

Prado, on the parallel of 17° 22′ S., stands, as above noticed, at the entrance of the little river Jucurucu, which forms an opening very apparent among the trees with which the coast is covered. You may approach this embouchure to the distance of three miles, and have from 9 to 13 fathoms of water,—bottom of sand and oaze; and this depth continues, along shore, as far as a league to the north of the small hamlet *Colombiana*, situate on the shore, E.S.E. from Mount Pascal.

The **ABROLHOS**, or Islets of Santa Barbara, at twelve leagues from the coast, in latitude 17° 58′ and longitude about 38° 36′, are four in number, exclusive of several patches of rock, of which the largest is at 150 fathoms to the north of the largest and easternmost islet.

These islets form between them a trapezium, of about 3000 fathoms in extent. The two northernmost are the highest; that to the west being 130 and the other 150 feet high. The groupe may be seen from the top-mast head of a frigate, at the distance of 22 miles, if the weather be clear.

The islets are formed of a soft whitish rock, which decomposes in the air, but hardens in the sea. It is of the same nature with that which constitutes almost all the other islets and rocks on the Brasilian coast. The Abrolhos, therefore, are perfectly sterile, with the exception of rushes, some cactus, wild purslain, and a cluster of small shrubs, whereof the existence is singular in the middle of this mass of rocks.

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* *Itacolomi* is a generic Brasilian name given to many rocks which appear above water, and to round hummocks on the coast.

Innumerable sea-birds cover the islets with their nests and eggs, but none of these birds are fit to eat. Turtle at times have been found, but not so frequently as the solitude of the place would lead us to suppose. Sea-salt, perfectly crystalised, is found in several places, and a small quantity of fresh water filters down to the base at the north point of the northern islet.

In July, 1819, few fish were to be found at the Abrolhos. This was, however, attributed to its being an unfavourable season; for it is in the vicinity of these islets that the fishery is carried on by the inhabitants of the neighbouring coasts. According to the information of the pilots, those of Porto Seguro, principally, send out 50 vessels every year, during the northern monsoon; they take cargoes of fish, of a good quality, which are called *Garoupas;* these are dried, and then compose an ordinary food for the people and slaves. The vessels generally remain out for six weeks.

It is, therefore, clear that the only object which a ship may hope to find, by touching here, during a part of the year, is relaxation for a crew fatigued from sea, or for repairing damage caused by accident or bad weather.

On the west of the Abrolhos is the channel distinguished by the same name, and which is bounded on the west by the extensive banks and reefs named the *Pracel das Paredes*, on which are many rocks even with, and some above, the surface of the water. These banks and the shore within them are very imperfectly known, not having yet been properly surveyed; but they are represented in two great divisions, and separated by a space of 3 leagues in breadth, from north and south. Their outer edges are from 8 to 10 leagues from the coast, and they are so steep as to have acquired the name of *Paredes* or *Walls*. The extent between their northern and southern parts, from the parallel of 17° 29′ to 18° 9′, is a distance of 13 leagues. There is said to be within them a small channel along shore, known to the coasters only, and not to be attempted without a most experienced pilot.

Within the parallels of the Paredes the coast comprises the towns of *Alcobaça, Caravelhas, Villa Viçoza,* and *Portalegre,* all of which communicate with the sea by rivers admitting the coasters.

The eastern side of the Paredes rises abruptly from the bottom of the sea, without indicating any diminution of depth. From the edge of these banks, as well as in the middle of the Abrolhos Channel, in clear weather, the opposite coast may be seen. This coast is flat and covered with trees, which, at this distance, appear as if nearly overflowed. Hence, also, the Abrolhos Islets may be seen. The Baron Roussin gives the position of Sta. Barbara, the Eastern Islet, as latitude 17° 57′ 44″ S., and 38° 41′ 47″ W., and Captain Fitzroy gives it as 17° 57′ 42″, and 38° 41′ 30″; but we take the longitude to be about five minutes more to the east. *Variation of the compass* here, in August, 1819, 0° 46′ W.

In the Abrolhos Channel, with the exception of a few spots of 7 fathoms, the general depths are from 14 to 9 fathoms. The direction in which there is the most water is nearly S.S.E. and N.N.W., in passing at two miles to the west of the islets. Large vessels may anchor in this direction from the islets at the distance of from one to eight miles.

The Baron Roussin says that, although this channel is three leagues wide, it is of little consequence to large ships; but a letter from a naval commander at *Rio*, dated in October, 1834, says, "We sailed round the Abrolhos Isles, and found the inside channel perfectly safe. In day-light and favourable weather any ship may sail inside them without risk."

It has been stated that H. M. ship *Doris*, by adopting the inner channel, in 1823, made the passage to Bahia from Rio Janeiro in half the time that the *Conway* did, by keeping well outside. The Doris sailed from Rio after the Conway, and arrived before. The Doris had smooth water and favorable weather, while the Conway had a troublesome sea, and much wind. (*Editor of the Nautical Magazine, January*, 1835, p. 52.)

In the remark-book of H. M. S. *Tartar*, 1823, Mr. Wood, the master, says, The Abrolhos are low, and their vicinity should be approached with caution; but with due attention to the lead, they may be passed with safety; and should a vessel be so situated, while attempting to pass them, either from the southward or northward, as not to be able to weather them without tacking, they will find a safe channel to the westward of them and of some rocks just appearing above water.*

Lastly, *Captain Fitzroy*, of H.M.S. *Beagle*, 1832, has said, "Having made both passages, I venture to observe that, going within the Abrolhos certainly shortens that between Rio and Bahia very much; but yet I would not recommend it to any vessel unless she has reason to make unusual haste. The soundings are very irregular, varying suddenly from 20 to 6 fathoms; and there are both reefs and currents."

The Tides are irregular in the vicinity of the Abrolhos; the currents follow the direction of the prevailing winds, and their velocity, when the Baron Roussin was here, did not appear to exceed one mile and three-tenths in the hour. The difference of level, between high and low water, was taken at 5 feet on the full and change.

In a letter addressed to Captain Beaufort by Captain Fitzroy, 10th of April, 1832, this gentleman has said, "On the 18th of March we sailed from Bahia, and worked our way slowly toward the eastern limit of the Abrolhos Banks. The winds, being light and easterly, favored our sounding frequently, and taking good observations.

"Having reached the parallel of the Islands, to the eastward of the easternmost soundings laid down in the charts, and finding no ground with 300 fathoms of line, I began to steer westward, sounding continually, and keeping a sharp look-out at the masthead. At two *p.m.* on the 26th, we had no bottom with 230 fathoms, and at four *p.m.* we found only 30 fathoms, without the slightest change either in the colour of the water or in its temperature, or any indication of so sudden a change in its depth.

"I directly hauled to the wind and worked back again to the eastward, to have another opportunity of confirming the place of the edge of the bank. We lost soundings as suddenly as we had found them; and, in standing to the westward a second time, with a grapnel towing astern, by 200 fathoms of line, we hooked the rocky bottom and straightened the grapnel; but my object in ascertaining the exact beginning of the bank was gained.

"From that spot we had soundings in less than 40 fathoms, until we anchored near the Abrolhos Isles.

"I passed to the southward and eastward of them, because that side had not been examined, but time would not allow of my doing what I wished while so favorable an opportunity offered.

"At least a fortnight would be necessary to complete the survey of Baron Roussin, which appears, so far as we have examined, to be extremely correct. The soundings are so irregular that little dependence can be placed on the lead. It is only by a multitude of soundings, by watching the sea when there is much swell, and traversing every part with a sharp look-out at the masthead, that the neighbourhood of the Abrolhos, particularly to the S.E., can be thoroughly examined.

"More than once we had 4 or 5 fathoms under one side of the vessel, and from 15 to 20 under the other side. The *sauts de sonde* [skips of bottom] as the French express it, are surprising.

"The tide, or rather current, which we experienced, set continually to the southward for the three days that we were near these isles, varying from half a mile to a mile and a half an hour.

"I supposed that the bottom was composed chiefly of coral rock, but was surprised to find no coral, excepting small fragments growing on the solid rock, which is chiefly gneis and sandstone. As most of the charts say '*coral rock*,' I have sent a few of the soundings for your inspection, and you will see by them that what has been here called coral is the coating of a solid rock formed by the deposit of the sea water, mixed with coralline substances, and what a sailor generally calls barnacles.

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* It appears that, from E.S.E. to South, by the North and West, vessels of moderate size may, with precaution, approach to a sight of the islets, and anchor at a distance from them of from one to eight miles, from N.W. to the south by the west. There is no part between the South and the S.E. on which there is any uncertainty; but it has been shown, in descriptions formerly given, that this part is not much more dangerous than the other. *Pimentel*, in alluding to an exploration of the coast, in 1605, says that several rocks, some of which were uncovered at high water, existed in the direction of S.E. from the islets in a space of about three leagues. In admitting this as correct, it will be seen that, in the only part not lately visited, the dangers do not extend much more to the S.E. of the isles than in the other directions.

On the bank of soundings upon which the Abrolhos are based, it appears that, generally, the depths vary abruptly: and frequently, in small spaces, deepen from several feet to as many fathoms. These undulations appear nearly in a north and south direction.—*Roussin.*

"My meridian distance of the Abrolhos Rocks from Bahia, their latitude and their size, agree precisely with those given in the French survey. But between Bahia and Rio de Janeiro, and consequently between the Abrolhos and Rio de Janeiro, there exists a difference of from 4 to 5 miles between us; this being the only point on which I have found any such difference either on this or on the Beagle's former voyage." *

The Baron Roussin has said that an oazy or muddy bottom is rarely found on the ground of the Abrolhos; the presence of oaze in the soundings being a certain indication that you are without the shoals. He found no part without a large mixture of sand and broken madrepore or bits of coral, and in the interior channel only; and he adds that the quality of bottom, most common around the Abrolhos, is a whitish sand stone, composed of the debris of madrepores, and of a greater or less consistence; sometimes this stone is very firm, combined of sand and rock, mostly to the N.E. of the islets. Nearer to these, from S.S.W. to N.E., by the west, the bottom consists of ground like white mortar, in which the anchor penetrates but little, though it holds fast.

On the low shore, in latitude 18° 36′, is the little river of *San Matheo*, described hereafter. At four or five leagues to the north of this parallel commence the soundings which announce the grounds of the Abrolhos and Paredes. In circumscribing these banks, the islets, and the shoals, in depths under 20 fathoms, an extent of twenty leagues, east and west, may be assigned; and it follows that a large vessel, unnecessarily, should never run to the westward of the meridian of 37° 40′ between the extreme parallels of the shoals, or 17° 30′ to 18° 15′ S., where about, upon the bank, a depth of from 20 to 25 fathoms may be found.

In following, from north to south, the meridian of 37½°, from the parallel of 17° 40′ to that of 18° 10′, the soundings skip, at certain places, from more than 100 to 24 fathoms, rocky bottom, indicating, as very probable, a still less depth; but, on a search several miles more to the East, no bottom was found with the common lead. In longitude 37° no ground at 200 fathoms.

IV. *The* COAST *from the* ABROLHOS *to* CAPE FRIO, *inclusive.*

SAN MATHEO.—The little river of SAN MATHEO has been noticed above. Little advantage can be gained by coming to the Bar of this place. The difficulty of the entrance, wherein there are only 4½ feet of water, in ordinary high tides, and 9 feet on the syzygies, does not allow access to any but very small vessels, and the breakers, which constantly appear at the mouth, render the navigation dangerous, even to canoes. The people of the country get over this sort of passage only with punts, drawing very little water, or on the rafts, called *Jangadas*, formed by uniting four or five pieces of timber, surmounted by a cotton sail.

The entrance forms a small opening, with breakers on either side, within which may be seen, among the trees, the masts of boats. It is said that, in fine weather, you may see to some distance in the interior; and at a little to the south of the bar, three small downs, of which the middle one is the highest, and which serve as a mark from the eastward. The Bar is in latitude 18° 37′ 10″, long. 39° 38′ 40″.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Rio Doce; West point of the Entrance	19	36	57	39	45	30
Serra dos Reis Magos; Southern Summit	19	50	27	40	16	17
Morro Almeyda	19	57	20	40	12	30

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* Journal of the Royal Geographical Society, Vol. II. pages 315, 316

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Mestre Alvaro; the summit	20	8	54	40	15	46
O Tubaraõ; Rock near the cape	20	16	23	40	10	0
Cape Tubaraõ; S.W. point	20	16	22	40	11	0
VICTORIA; Piton to the North of the town	20	17	49	40	16	40
Dangerous Rock in the Bay of Espirito Santo	20	18	32	40	11	28
Cape Penedo in the River	20	19	16	40	16	3
Nossa Senhora da Penha; Church	20	19	34	40	13	35
Rock Balea, in the entrance of the river	20	18	50	40	12	37
Mount Moreno; the summit	20	19	23	40	12	0
Pacotes Rocks; the largest	20	21	2	40	10	15
Isle Jicu; the summit	20	23	9	40	12	30
Point Jicu; the summit	20	26	1	40	14	30
Ilhas Razas (Low Isles) the middle	20	42	42	40	16	15
Isle Calvada; the middle	20	44	8	40	19	30
Guarapari; steeple on the S. point of the bay	20	43	56	40	25	15
Morro Bo (an insulated mountain)	20	47	34	40	33	50
Morro of Benevento; summit	20	55	21	40	41	38
Serra de Guarapari; Western summit	20	50	15	41	3	15
Serro do Pico: highest part	21	1	30	41	13	0
————; Fourchu Hill, to the West	20	58	23	41	31	35
Mount Campos; Southern summit	21	22	38	41	21	56
Mountains of Furado; the highest	21	49	58	41	37	30
St. Anna's Isles; the largest	22	25	0	41	40	0
Peak of Frado de Macahé	22	12	2	42	5	0
Morro of San Joaõ; summit	22	32	26	41	59	0
Isle Branca or White Isle; summit	22	43	42	41	52	30
Cape Busios; extremity	22	46	3	41	49	30
Aucoras Isles; the easternmost	22	46	26	41	45	0
Papagayos Isles; the N.E. Isle	22	52	9	41	51	45
CAPE FRIO; Northern summit	22	59	55	41	56	30
————; the Southern point	23	1	18	41	57	30

The communications between the sea and the interior of Brasil, by the mean of rivers, are in general, very difficult, and they are particularly so in the river of San Matheo, as well as in a great number of other rivers, which resemble it, and which we shall have occasion to notice hereafter. The pilots say that the river of S. Matheo turns to the north above the entrance, after which it has many sinuosities. The little town which bears its name is at seven leagues from the entrance.

At 36 leagues to the southward from the Bar of San Matheo is the *Point Tubaraõ*, on the north side of the Bay of *Espirito Santo.* The coast between, generally low and sandy, is broken by the mouths of the small rivers named *Rio Seca*, *Rio Doce*, *Reys Magos*, and *Carahype*, which are all unimportant to navigators. No danger is to be apprehended on this coast until you reach Point Tubaraõ, from which point a reef of rocks extends to the distance of 700 fathoms: with this exception you may approach any part of the coast. At two or three miles off, whether advancing from the north or the south, the depths are from 20 to 9 fathoms, bottom of sand, mixed with gravel, oaze, madrepores, and broken shells.

RIO SECA.—The Bar of the Rio Seca is ten leagues to the southward of that of San Matheo, and presents only a small opening between the trees on the coast. It is probable that this river exists only during rainy weather, and the supposition seems confirmed by the only information obtained concerning it.

RIO DOCE.—The entrance of the Rio Doce lies in latitude 19° 36′ 57″, long. 39° 45′, ten leagues to the southward of the Rio Seca. It is said to extend far up the country, but its entrance is too small to admit large vessels: it however appears like a large open space between the trees, with which the coast is covered. A bank of red sand extends from each of its two points, and the entrance is again obstructed by another bank of sand, which rises above water; but there are no islands before the river, as shown on some old charts. The northern point extends out a little more than the other, and has on it a large house.*

From the Bar of the Rio Doce to Ponto do Tubaraõ, or Shark's Point, the distance is about 16 leagues, and the general trend, with some inflexions, S. 32° W. Great part of the coast is low, covered with trees, and the shore is of red sand; but all the interior, from the Rio San Matheo, gradually rises to the westward; and for ten leagues northward from Point Tubaraõ the land is more elevated down to the shores; it is only to the northward of the Rio Doce that the country, viewed from the sea, appears entirely flat, and it does not change this appearance till, in proceeding northward, you reach the offing of *Mount Pascal*, a distance of more than fifty leagues.

ESPIRITO SANTO or PORT VICTORIA.—The entrance of this Bay may be readily known, in advancing either from the north or the south, by conspicuous marks, seen from the offing. These are two mountains, whereof the one, situate on the south point of the bay, is named *Monte Moreno,* and the other, north of the bay, bears the name of *Mestre Alvaro,* which the pilots pronounce *Mestialvé.*

Mount Moreno is conical and partly woody, but devoid of verdure on the eastern side, and it may be seen, in clear weather, at 10 leagues off. Its base forms, on the north, the south side of the entrance of the river of Espirito Santo. At 2½ miles to the S.E. of it are two rocks of unequal size, named the *Pacotes:* and at about a mile S. 60° W. from Mount Moreno is the *Morro of Nossa Senhora da Penha,* a rocky hill, on the summit of which is a handsome church of the same name, and which may be seen at a distance of five leagues.

The elevation of the *Mestre Alvaro* to the northward, its form and insulated position on a land rather low, renders this mountain equally remarkable; and it is to be noticed that it succeeds the low lands of the north, and nearly terminates the high lands of the south, so as to leave no doubt, when it is in sight, as to the position of the vessel, even when the latitude is uncertain or cannot be obtained.

Two islets, situate at a short distance to the N.N.W. of Monte Moreno, occupy a great part of the harbour of Espirito Santo; but, although the space comprised between these isles and the hill is much obstructed by reefs and two rocks, *la Balea* (the whale) and *le Cavallo,* yet there is a sufficient passage for large vessels entering the river, and it may be seen, by the plan of the bay, that it has not less than 18 feet of water. This passage is very narrow, but the pilots say that it is the best.

To a stranger, the best anchorage appears to be without the entrance, in 12 or 13 fathoms, whence the college at Victoria will be in a line with the northern base of Mount Moreno. Here you will have a bottom of oaze, good holding ground, and be a mile without all danger; and here you will be in a line of direction for proceeding upward, with the assistance of a pilot.

A visit to the Bay of Espirito Santo may be useful and interesting to the mariner. At a league above the town of Victoria, and even in the town, very good water may be obtained. At the habitations on shore you may also procure wood, cattle, and an abundance of fruits of the country, at a moderate price. M. Roussin adds, We do not think that the climate of this town is very wholesome, as we found it extremely humid. The height of the mountains and lands around, and the great cut of the river, on the north shore of which the town is built, account for this condition. At a thousand fathoms to the east of the meridian of the town is an enormous conical rock, named *Paõ de Açucar,* (*Sugar-loaf*) for which you steer on entering the river, so soon as you have doubled Mount Moreno.

The town of VICTORIA, capital of the province, and built like an amphitheatre on the side of the river, may contain 3000 or 4000 inhabitants. If the entrance of the river be as deep as reported, the port must be a good one, as within the bar are found, in some places, from 50 to 60 feet of water.

Mount Moreno is situate in 20° 19′ 23″ S. The variation near it, in July, 1819, was

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* It was stated, in a former description, that "the current of the River Doce is so strong that its waters are distinguishable by their colour to the distance of a league and a half at sea; that small craft only can enter the river, and these not without difficulty, from the impetuosity of the current, but it is navigable for boats and canoes more than twenty leagues."

1° 2′

1° 2′ E. Rise and fall of tide in the anchorage, about 4 feet. The tides without the entrance are not regular. Within, on the full and change, it is high water at three o'clock.

ESPIRITO SANTO to BENEVENTE.—Near the land, to the southward of the Pacotes, are the islets and rocks of *Jicu;* and, at 13 miles more to the southward are the *Guarapari Islets,* between which and the land is a passage for small vessels; and all may advance to the eastern side of them, for there is a depth of 7 fathoms. Farther south, about a league, are the low islets called the *Razas;* and farther on, at an equal distance, is the islet *Calvada,* at four miles from the coast. Large ships may pass within the Razas and Calvada, as the depths are from 18 to 11 fathoms.

The RIVER GUARAPARI, to the west of the islet Calvada, falls into the sea between two woody hills, of which that to the south is distinguished by some palm trees, visible in the offing, many houses, and a church with a steeple. The latitude of the last is 20° 43′ 56″. The hill to the south is named in the country *Perro de Caõ;* the other is the mountain of *Guarapari.* The latter is the highest; and it appears that, to enter the river, it should be to the N.W.

The coast hereabout, and to the northward, is of moderate height, almost covered with small trees, close to each other, and having, at certain distances, low yellowish cliffs, which are not found to the southward of the point of Benevente, which is 14 miles S.W. from Guarapari, in lat. 20° 53′ 50″. In the interior of the country are several groupes of remarkable mountains, upright, conical, and inclined, which give to this part of the coast, a character different from that which precedes it to the north and follows it to the south.

From the parallel of the Point of Benevente to that of the isles of St. Anne, in 22° 25′ S. the shore is at a great distance from a chain of mountains in the interior, leaving between them an extensive plain, very low, and extending in some part 13 leagues. At this distance from the mountains lies that elbow of the coast named *Cape San Thomé.*

This part of the shore of Brasil is nearly level with the sea, and you will perceive only some trees and small patches of land at a distance; the country appearing as if overflowed. Prudence will, therefore, dictate a sufficient offing. A considerable tract hereabout was only superficially examined by the Baron Roussin, and the information imparted to him by the coasters was erroneous, but the deficiency has been, in a great measure, supplied from the information of British officers.

At about five miles S.W. by S. from the islet Calvada, near Guarapari, the soundings are irregular, and there is frequent occasion to haul out, in order to keep a depth of 12 fathoms. Such soundings extend out about four miles to the S.S.W., and the water about them is discoloured. The least depth found was 6½ fathoms, and danger, if any, will show itself plainly; for the water shoalens very suddenly from 12 to 8 and 6 fathoms.

An islet named *Francesa* lies at about four miles from shore, in latitude 20° 58′; and a reef, having 7 fathoms close to it, stretches about a quarter of a mile from its N.E. point. Between the islet and main, the depth is not more than 3 fathoms, shoaling gradually with a hard bottom. There is anchorage in 7 fathoms, sandy ground, with the islet N.W. by W. ½ W. three quarters of a mile.

At about six miles S.S.W. ½ W. from Francesa is another islet, *Piuma,* small and low, with reefs extending about half a cable's length from the N.E. and S.W. points. In the passage between it and the land are 5½ fathoms, sandy bottom.

About seven miles S.S.W. from the islet Piuma, and at nearly five miles from shore, is a sand bank of 4 fathoms, with 9 and 10 fathoms on each side of it; but shoaling gradually toward the land. Its length has been estimated at a mile and a half long, N. and S. by one quarter broad. The water on approaching and receding, shoalens and deepens very abruptly. Off *Point Murubu,* in latitude 21° 11′, there is an appearance of breakers, at two miles from land.

From Point Murubu, in lat. 21° 11′, to Cape San Thomé, in 22° 2′, the coast is generally a low sandy beach, thickly covered with brushwood, having here and there a stunted tree. The cape, *as it is called,* terminates in a low sandy point; the country, to a great extent within it, is low, and intersected by many rivers and lakes.

The soundings off Point Murubu are very irregular, 13 to 9 and 6 fathoms; the water thence deepens suddenly, with a hard rocky bottom. S.E. from this part of the coast, 10 or 11 leagues off, there are 20 to 22 fathoms of water, and bottom of very fine white sand :

but hence toward the shore on the west, and toward Cape S. Thomé, it gradually becomes coarser and more regular.

It has been noticed, as an indication that may be useful, that, in the vicinity of Cape San Thomé, the oazy bottom, so common to the south of this parallel, almost entirely disappears, being here succeeded by a bottom of sand and broken shells; these are, at least, the qualities of bottom found on the survey, from the coast to the distance of 10 or 12 leagues off. It may be remarked again, that at several leagues to the south of the parallel of Belmonte, (described in page 123) or about 16° 20′ S., commences a bottom of white tufa or sand-stone, mixed with, or formed of, broken madrepores, which extends far to the northward, and which is scarcely if at all found in the south.

CAPE SAN THOME.—A bank to the northeastward of Cape S. Thomé, formerly omitted in the charts, has been explored, in consequence of one of those accidents by which so many dangers have been made known. On this shoal, as we have been informed by Captain Livingston, the ship *Earl of Morley* struck and lost its rudder, and a Jersey vessel has been wrecked. It extends 12 miles out from the land; the general depth of water on it is uncertain, but on one spot only three feet were found. There is a passage between the shoal, (now called the *Morley Bank*) and the land.

From a delineation of the shoal, by Mr. Napier, R. N. Master of H. M. S. Wellesley, 1825, it appears to be a rocky bank, of an oval form, and four leagues in diameter. The southern edge in a line with Cape S. Thomé bearing nearly E.N.E.

From the *River Parahyba do Sul,* or the parallel of 21° 37′, northward to lat. 21°, the coast gradually heightens, and has several remarkable hills inland; but in 21° the beach is not more than from 30 to 40 feet above the level of the sea. In about 21° 10′ are three remarkable red cliffs, close together, the largest being to the southward. In about 21° 28′, at some distance inland, is a remarkable sugar-loaf hill, tapering to a fine point or peak at the summit.

From the parallel of 21° to 21° 10′, the soundings are very irregular near the shore, frequently altering 3 or 4 fathoms at one cast of the lead; at six miles from land 5, 7, 10, and 13, fathoms have been found. Hereabout the great bank of soundings appears to be steep on the outside, deepening suddenly from 26 fathoms to no ground at a depth of 100 fathoms. In all the space of 9 or 10 miles over these irregular soundings, the bottom is of rotten stone and coral, changing on the outer edge to coral and shells.

On approaching Cape San Thomé the soundings are very regular, over a sandy bottom, and on approaching the shoal the ground becomes finer; a few casts of mud may be found, but the bottom, generally, is of fine sand.

The eastern extremity of the *Shoals of San Thomé,* having 4¾ fathoms, appears to bear from the cape between East and S.E. 7 or 8 miles. H. M. ship *Jaseur,* Captain Martin, in November, 1825, crossed in the last mentioned depth, and a native sumach, about a mile and a half within, from that ship, had 4 fathoms. The least water found upon this shoal, on examination, inshore from the ship, was 3, 3½, and 4 fathoms.

On approaching the cape, the water deepened to 5 and 6 fathoms, forming a channel within the bank, the depths in which have not been ascertained.

About the Barra de Furada, to the westward of Cape S. Thomé, there is little else than barren sandy flats, with a few fishermen's huts at the entrance.

In 4½ fathoms, and close to the breakers of Cape San Thomé, the current has been found so very strong that a ship with difficulty got out again. In 3½ fathoms, to the southward, the water was so much agitated, and the current so strong over the breakers, that even a small vessel could not attempt it without danger.

A ship falling in with this part of the coast during the months of April, May, and June, may make toward the land in safety, only taking care not to enter into less than 10 fathoms when off the cape; as it is probable that there will be a current setting south-eastward, at about two thirds of a mile in the hour.*

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* On the 29th of November, 1834, the Brasilian frigate *Principe Imperial,* in steering S.W. by S. in the latitude of Cape S. Thomé, and longitude 40° 30′, at eight *a. m.* sounded in 32 fathoms; at 3h. 15m. *p. m.* in nine, and at 3h. 20m. in six and a half five: the ship running between 5 and 6 knots,

St. ANNE'S BAY.—The large Bay, formed between Cape San Thomé in lat. 22° 2′ and Cape Busios in 22° 46′, is named *St. Anne's Bay*. The distance between these points is nearly 22 leagues. The bay is deep and spacious; in rough weather the surf is violent, and the broken water runs up a long inclined plane. Mr. Luccock says, when the sea is serene, and the ripple comparatively light, it eats away the sands, and forms a flatter beach, with a perpendicular boundary, wherein the laminated appearance of the sand is remarkable. To the southward the shore is covered with shingles, and when it meets the high rocks beyond the River Una, in the S.W. part of the bay, it becomes bold, stretches to the eastward, and forms the point of *Buzios*, called in some charts *Cowries Point*. Near the mouth of the Una is the small secure bay of the *Armaçaõ* or *Armazem*, affording refuge to vessels baffled in their attempts to double the cape, and when the wind blows hard from the east. The entrance is between two small rocky islands, called, from their different appearance, the *Beautiful* and the *Ugly*. The anchorage lies to the south-eastward of the entrance.

The *Morro of St. Joaõ*, on the north bank of a river of the same name, is a conspicuous mark for the bay of St. Anne. Its situation is, lat. 22° 32′ 26″, long. 41° 59′.

Within the Bay, at the distance of fifteen leagues from Cape San Thomé, are three islets, named the *Isles of St. Anne*. These, seen from S.S.W. and N.N.E. appear united. The southern isle is the highest, and the lowest is to the east. According to the pilots, the channel between them and the main is so safe, that you may here repair any damage, and careen the vessel if required. The depth to the southward of the isles, at four or five miles from land, is from 17 to 27 fathoms; oazy bottom.

From the Barra de Furada toward St. Anne's Islands the depths are regular, there being 9 or 10 fathoms of water, sandy bottom, within five or six miles of the land. At four or five leagues from the coast are from 20 to 22 fathoms, muddy bottom. This sort of bottom extends across to Cape Busios, with 29 and 30 fathoms: a change to sand is a proof of approaching the land.

Off the N.E. part of St. Anne's Isles are several barren rocks: On the N.W. side of the isles is anchorage, in 7 and 8 fathoms, well sheltered from easterly and S.E. winds, but exposed to the S.W. and N.E., but with the latter there is seldom much swell. The proper route to this anchorage is by the S.W. through a clear passage, with 10 and 12 fathoms, close to the isles, near which is the deepest water.

From off the north end of the largest isle a sand-bank stretches to the S.W. and W.N.W., with three to five fathoms over it, the greatest depth being at above half way across the passage toward the main. This, therefore, impedes the passage from the N.E.; but the ship may beat out of the S.W. channel. Large vessels attempting the latter should carefully keep the S.W. end of the larger island to the eastward of S.E., because the water shoalens suddenly on the S.W. side of the bank, and likewise toward a sandy beach on the large island.

About St. Anne's Isles the soundings are regular, excepting on the bank which extends westerly from the north end of the larger island. This bank is steep-to on both sides, the water suddenly shoaling from 7 to 4 and 3 fathoms, bottom of mud, but on the outside of the islands sand only.

From the anchorage, in 7 fathoms, at three quarters of a mile from the sandy beach on the large island, the bearings are, the S.W. point of the large island south; the northern part of the same E. ½ S.; the outer point of the S.W. island N.N.E.: and the islet Ferro, at the entrance of Macahe River, N.W. by W. ½ W. Large ships should bring up farther

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knots, a dark squally morning, with all sail set. No time was lost in shortening sail, and the small bower anchor cut adrift, when the ship was in half four. Her draught was 22 feet, and a heavy swell on at the time.

At day-break the shoals of St. Thomé, breaking very high, bore W. by N. one mile distant. At this time it cleared away, and they could see nearly 30 miles from the masthead, but no land was to be seen.

On the ship running out E. by N. at the rate of two knots for three hours, the soundings were very irregular, from 5 to 7 and 8 fathoms, and then lessening to 5 and 4½, sand. Off the shoals, soundings were obtained in 26 fathoms, after having run off at least twenty miles.

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to the southward, keeping the S.W. point of the large isle about S.E. one mile, where there will be found 7 or 8 fathoms, at a sufficient distance from the shoal.

There can be no difficulty in gaining the anchorage at any time; only recollecting that the passage to it from the N.E. is hardly of sufficient depth for large vessels.

About the middle of the sandy beach of the large island there is a passage, through the trees, to a well of scanty and indifferent water, but firewood may be obtained here in any quantity, close to the beach.

SAN JOAÕ DE MACAE or MACAHE.—In the bay within St. Anne's Isles is the village of *Macahé*, situated between the northern bank of the River Macahé and the sea-beach. It consists of about 150 houses, neatly painted and white-washed; for the most part small ones, and of a single story, with a few of superior size and pretensions, on a rising ground, near the mouth of the river; where, also, near the summit, stand the church and flag staff. The mouth of the harbour is not more than seventy yards broad, and unfit for the entrance of vessels of more than 200 tons. If the flag be hoisted, it is a signal that the entrance is safe. In going in, a vessel must steer close to the south side of the rock; and, when she comes abreast of it, should let go her anchor, with about 15 fathoms of cable. If she overshoot this berth, she must put the helm hard a starboard, and run between the southern point, where there is a channel eight feet deep and two miles long, with remarkably clear water. A little south of the mouth of the harbour and close to the shore, lies a ledge of rocks, which must be carefully avoided.

The mouth of the River Macahe bears N.W. by W. ½ W. from the largest St. Anne's Isle, with the islet *Ferro* off the entrance, a barren rock, with some bushes upon it. There are two or three rocks at about three quarters of a mile from the islet, over which the sea breaks, but there is a passage on either side.

In the river, water may be obtained in any quantity; and a supply of refreshments, by giving two or three days' notice, as they must be procured from the interior country.

At times, the water from this river, on running toward the S.W. passage of St. Anne's Isles, appears much discoloured, like that of a sand-bank; but with a change of wind it resumes its proper colour. Such changes in the colour are attributed, not to shoals, but to rains in the interior and the operation of the wind.

The Morro of San Joaõ or S. Joam may be easily known by its insularity on the coast, the undulation of its summit, and its distance from the chain beyond it in the interior. Its latitude is 22° 32′, in longitude 41° 59′.

At 20 miles N. ¼ W. from this morro is seen another hill, very high, and surmounted with a peak, remarkable for its leaning toward the north. This is the *Frade* (Friar) of *Macaé* or *Macahe;* it stands in lat. 22° 12′ 2″.

ANCORAS.—At seven leagues S. by W. from St. Anne's Isles, lies the groupe called the *Ancoras* or *Anchor Isles.* These consist of two islets and a large white rock lying to the southward of the inner one, and connected to it by a reef. The outer islet is 5 miles E. by S. from Cape Busios, and between the islets is a channel of 23 and 24 fathoms. The easternmost islet resembles a cardinal's hat. Small vessels, it is said, may pass between these islets and the land; and it is admitted by the pilots that the depth of water in the passage may allow vessels of every class to pass through.

To the northward of Point Busios is the little isle *Branca* or White Isle; then follows a beach of sand, which ends at the Morro of St. Joaõ or Joam, with two or three small rivers, and the islet *do Ferro*, a barren rock, with some bushes upon it, as already described.

PAPAGAYOS.—The continental coast between Cape Busios and the *Isle Frio* forms a bay called *Papagayos* or *Parrot's Bay.* The bearing and distance between its extreme points are S.S.W. 14 miles. A great portion of the bay is occupied by a groupe of islets and rocks, which do not appear to have been accurately surveyed.

At about six miles to the northward of the isle Frio, and at the north end of a low sandy beach, are a small fort and flagstaff, on the south side of the entrance of a little river, which falls down from the village of Papagayos.

CAPE FRIO, is a high and rugged promontory, the southwestern extremity of an isle bearing the same name, which forms on its N.W. side a convenient harbour, *Port*

Frio, affording good shelter, although open to the N.E. The summit of the isle is in latitude 22° 59′ 55″, longitude 41° 56′ 30″.

Frio Isle, which forms the S.E. side of the harbour, is nearly three miles in length from N.E. to S.W., and one mile in breadth. Great part of it is covered with an almost impenetrable wood. Beautiful flowers abound in every part, and these are not limited to the small class of plants, as there are large trees covered with the most luxuriant bloom; but there are also reptiles in most extensive variety, from the alligator to the green lizard, and snakes from one to thirty feet in length, many of which are beautifully variegated. Beautiful birds also abound, but few of them sing; and there are myriads of insects, many of which are distressingly troublesome.

The Isle of Frio may be seen, under favourable circumstances, at fifteen leagues off. When bearing from the East or the West, it presents two mountains, one of which is 1570 and the other 1300 feet high, above the level of the sea: the southern is the smallest, both in height and breadth. On a N.N.E. and S.S.W. bearing these two mountains seem to form one mass, with a double summit, like two small points: at the same time will be seen a little conical islet, at one or two cables' length to the E.S.E. of the cape..

On all the shore, at the distance of a mile, from the north to W.S.W. by the south, are found from 27 to 45 fathoms of water, bottom chiefly of oaze.

An official notice, dated Rio Janeiro, 28th of July, 1836, and given by order of the Minister of the Marine, signified that, from the night of the 12th of that month a *Light-house*, called that of Cape Frio, would show a light, interrupted every two minutes by an eclipse of equal duration, instead of an ordinary fixed light, which had previously been exhibited. The light is visible, in very clear weather, at the distance of 41 miles.*

PORT FRIO, or the Harbour, is more than a mile in extent each way, and its depths are from 19 to 4 fathoms; but in the centre, 12 to 16 fathoms. Its great entrance is at the east end, on the south side of an elevated islet, named *Ilha dos Porcos;* this entrance is about two thirds of a mile wide, and its depths are 25 to 15 fathoms, bottom of fine mud and sand. The entrance from the S.W. is very narrow, but has a depth of 10 and 12 fathoms, and there is anchorage almost immediately within it, for large ships, in 7 to 10 fathoms: farther in is a bar, on the shoalest part of which are only 10 and 11 feet; so that this passage is fit for small vessels only.

The harbour is commodious, and secure against all winds, excepting N.E., but even with the latter you may be sheltered by the little isle *dos Porcos*, (300 feet high,) which lies on the north side of the entrance. This anchorage, wherein the bottom is of good holding ground, is useful to the coasters, who can go out by either of the passes, according to their destination northward or southward, and the direction of the winds.

In time of war a signal post or telegraph is placed on a mountain to the west of the cape, and which, communicating with Rio Janeiro, denotes what is passing here.

A small fort, with four guns, stands on a rocky point between two sandy coves on the N.W. side of the harbour, and which entirely commands the principal entrance to the anchorage. A little within this fort is a village, occupied mostly by fishermen. There are some fine sandy places here for hauling the sein, which appears to be the chief occupation of the inhabitants.

Water may be had from wells in the coves on the north and N.W. as well as on the island,

Cape Frio bearing W. by S. 25 miles.

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* The situation of the lighthouse was not defined, but we may presume, from the range of ligh,t that it stands on the summit of the island; and at this height, being obscured by clouds, it is often invisible.

island, near its west end, where huts may be seen. The tide flows here, on full and change days until 9h., and its vertical rise is about 4½ feet. *Variation* of the compass 2½° E.

V.—CAPE FRIO *to* RIO JANEIRO, *inclusive*.

[For some remarks on the Winds upon the coast and at Rio Janeiro, by Captain Hewett, see pages 1, 2, and 3.]

The assumed situation of Cape Frio, as we have shown, is latitude 23° 1′ 18″, and longitude 41° 57′ 30″. This rugged promontory is the most remarkable headland, as well as the most important landfall, on all this part of the coast. From off this cape to the *Sugarloaf*, on the west side of the entrance to Rio Janeiro, the course by compass is nearly West, and the distance 63 miles. The land between is mostly low and sandy; but at a distance from the beach it rises to a series of elevated and uneven mountains; an appearance interesting and picturesque.

At about half a mile from the extremity of Cape Frio, which is about half way between the S.W. and West points of the island, is a cove in which H. M. S. *Thetis* ran ashore and was wrecked, in the night of the fifth of December, 1830.

The Thetis, having completed her period of service on the South American station, sailed for England from Rio Janeiro on the preceding day. Ships of war returning home from South America being generally freighted with treasure, the Thetis had on board 800,000 dollars. The weather, after she had sailed, proved tempestuous, and the wind blowing strongly from the eastward, the effect, as supposed, was a current that was fatal to the ship.

An interesting detail of subsequent events, and the singular means employed for recovery of the treasure, is given in the *Nautical Magazine*, March, April, and May, 1832, illustrated with a plan, by Lieut. Kellett, and two curious engravings. Of the 800,000 dollars, 620,000 were brought up from the bottom of the sea.

According to the report of the British officers, during their stay here, for the recovery of the treasure, a small village was constructed near the cove, but whether it may continue seems uncertain. Roads were also cut leading to the cliff where the Thetis was lost. Previous to this event the island was totally uninhabited. The village, called *St. Thomas*, stands on an acclivity steeper than Portsdown Hill, in England, at about 100 yards from the beach on the west, with evergreen shrubs, bearing flowers, in the intervals between the houses; but it must be added that, half of the men employed here were at one time lame from the kind of flea called the *jigger*, so we may conclude that, fine as it is, the island will never have a numerous population.

Ships bound to Rio Janeiro, when approaching Cape Frio by night, with the wind easterly or S.E., must be cautious not to run into the bay to the northward of the Cape: such mistake having proved fatal to several ships. This, however, can never happen in future, while the light on the summit of the island is visible. A considerable swell sets in with E.N.E. winds, which are most prevalent.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Cape Negro; the point	22	57	10	42	37	30
———; highest hill to the North	22	52	38	42	37	5
Maricas; Southern Isle	23	0	53	42	53	0
Raza; lighthouse	23	4	17	43	4	25
Redonda or Round Isle; summit	23	4	45	43	6	48
Nossa Senhora da Gloria; the steeple	22	54	42	43	6	35
RIO JANEIRO; Sugar-loaf (1292 ft.)	22	57	14	43	4	55
———; Vilganhon flagstaff	22	54	31	43	5	37
———; Isle Ratos or Rat Isle	22	53	16	43	6	20
———; Morro Corcovado; summit (1580 ft.)	22	56	13	43	9	30
La Gabia, or Gavia	22	59	0	43	13	0

CAPE NEGRO,—at 12 leagues to the west of Cape Frio, is the first remarkable prominence in that direction. It is formed by a small hill, the extremity of a range of mountains extending to the north, and is covered with a dark verdure, hence its name, and may be readily known. Being steep-to, it may be approached safely. Within three miles of it the depths are from 18 to 27 fathoms, bottom of soft oaze.

Between Cape Frio and Cape Negro the sinking of the land is remarkable, presenting no object on the coast excepting here and there a few little hillocks on a flat sandy shore, with some scattered bushes. One of these sandhills is distinguished by the ruins of a church standing on its summit, and dedicated to *Nostra Senhora de Nazareth.* This is about 3½ leagues E.N.E. from Cape Negro. Between this church and Cape Frio, within the low flat shore of *Maçambaba,* is a lagoon which extends seven leagues, and has small openings to the sea.

At about two leagues from the coast the depths are from 27 to 36 fathoms, over a good bottom of oaze. At ten leagues are 68 to 80 fathoms, coarse sand, rocks, and oaze.

Two islets named the *Maricas,* lie at the distance of 13 miles S. 79° W. from Cape Negro, and nearly 16 leagues West from Cape Frio, at about a league from the coast. They are of moderate height, steep-to on the south side, and may be approached safely. If, on the approach of night, or under particular circumstances, a vessel cannot reach the entrance of Rio, she may advance to and anchor here.

On the 24th of November, 1825, H. M. S. *Jaseur,* Captain Martin, anchored off the western side of these islets, in 17 fathoms, coarse sand and mud, with the rock off the southern island bearing S.E., the passage between the isles E.S.E., the northern end of the isles E.N.E. ¼ E. and in a line with Cape Negro. During the mornings of the 24th and 25th the boats were employed in sounding round and between the islands; in every part was deep water, and no dangers but what were in sight. The general depth to the westward of the islands was 10 and 12 fathoms close to the beach, with 14, 15, 16, and 17, fathoms, at the distance of a mile to a mile and a half. Between the islands and main are 13, 12, 11, and 10, fathoms, close up to the beach.

As this place is sheltered from the S.E. round by the North to W.N.W. and more West, with a fine sandy bottom, it may be considered as safe when the wind is to the northward and eastward or to the northward and westward.

On the eastern side of the isles the sea commonly breaks with great violence, so that landing there is very difficult. The best place is near the N.W. end of the larger isle. In a small sandy bay on the low part of this isle is a well with good water, but it cannot be obtained without trouble in getting it off.

CURRENTS.—The general prevalence of the Currents in the vicinity of Cape Frio appears to be to the southward, but varied to the eastward and westward according to the strength and direction of the wind; and westward of the Cape it is, *at times,* found setting to the N.E.*

Having given in pages 9 and 10, the general observations on the Brasilian currents made by MM. Roussin, Hewett, and Lindley, it may not be amiss to introduce here an extract from Major Rennell on the same subject.

The Stream Current of the Eastern Coast of Brasil, "is of inconsiderable breadth, till, increased by the accession of drift current by the S.E. trade, it arrives in 16° or 17° south, where, to the distance of 250 miles from the coast the current runs to the South of S.W., and gradually declines to the southward till it becomes S.S.W., or nearly along shore to Cape Frio, where its rate was found to be 30 miles per day, at 200 miles from the shore. Here by the fall back of the land to the W.S.W., the direct current is thrown farther off shore; and, as generally happens in such changes of direction of the coast, a *counter current* in the Bay runs to the N.E. within Cape Frio.† Farther to the South, in 30° and 32°, the current is found again to run more westerly, conforming to the trending of the coast, at the rate of 15 to 20 miles per day, and is found at 250 miles from the coast, extending to the north of the river Plata.

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* Some hours before and during East and N.E. winds, the current runs past Cape Frio to the southward, causing an easterly eddy along the south shore, which reaches nearly to Cape Negro.

With the wind from West to South, and previous to a change in that direction, an easterly current passes the cape and extends some distance to seaward. The rate, in both cases, is from half a mile to a mile and a half in the hour.—*Capt. Hon. F. de Roos, R.N.*

† To this current may be mainly attributable the melancholy catastrophe of H. M. S. *Thetis.*—Ed.

"*The Brasil-Current, south of Cape Frio,* rests on the authority of Lord Anson's journal, Captain Cook, and the Russian Captains Krusenstern and Lisiansky; and the *counter-current*, between St. Catharine's and Cape Frio, on those of Captains Krusenstern and Lisiansky, and Captain Terin, of the East India service."*

But, upon the whole, no dependence can be placed on the general set of the current; and it is clear, from what has been already said, that it is always uncertain. When the wind is fresh between the North and East, it sets strongly to the southward and westward, and with a wind from the S.W. the current will set with equal strength north-easterly; the rate being in a ratio with that of the wind.

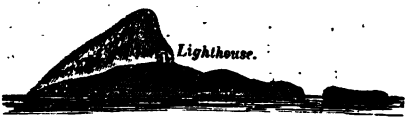
A bottle from H.M.S. *Maidstone*, on her passage to Bahia, in lat. 18° 20', long. 34° 56', 24th of April, 1832, was taken up, on the beach of *Poxim*, about 500 miles N. 8° W. *true*, from the spot in which it was dropped, 7th of June, 1832. Its daily rate cannot be known, but the mean of the drift must be, at least, 10 miles per day. This was in the southerly monsoon, between the parallels of 10° and 18½° S.

RIO JANEIRO.—The mouth of the Harbour of Rio Janeiro lies between two islets, *Paya* and *Maya*, to the east of it, and a bold point, surmounted by the *Gavia*, a remarkable mountain on the west. In front of it are the islets *Redonda* and *Raza*, within and westward of which are several other islets. From Paya to Gavia the bearing and distance are about W. ¼ S. 11 miles.

The islet Raza is low, and appears from the east like a slipper, with the sloping side northward. It is now distinguished by a *Lighthouse*, which was first lighted on the 31st of July, 1829. The light is so elevated as to be seen nearly ten leagues off. It makes a revolution in every three minutes, and presents, alternately, a brilliant and a *red* light. The utility of this light is too obvious to require comment. Its situation, as shown in the Table, is lat. 23° 3' 30", long. 43° 4' 45".

At two miles W. by S. from Raza is another isle, more elevated, appearing exactly like a haycock, and called *Redonda*, or Round Island.

These isles are very useful marks to vessels bound to the harbour: for a vessel bound to Rio Janeiro should, after rounding Cape Frio, steer due West, keeping about three leagues from the coast, until she makes Redonda, and which will be descried before Raza can be seen, although the latter lies two miles more to the eastward. CURRENTS, at times, set along the coast, either East or West, according to the winds, and thus retard or facilitate a ship's progress.



Raza and Redonda, bearing W. ¼ S. about three leagues.

The FOLLOWING DESCRIPTION of the land between Cape Frio and Rio Janeiro is from Mr. Luccock.

The first land generally seen, on advancing toward Rio Janeiro from the eastward, is Cape Frio, giving its name to the adjoining district. Without the Cape, on the north, is the bay of Papagayos, which exhibits a fair specimen of Brasilian scenery.

From Cape Frio, westward, a stranger, having no vessel under his care, would proceed most pleasantly along shore, until the *Ilha Pay* or Paya Isle, is brought on with the Sugar-loaf on the western side of Rio Janeiro. This would give him an opportunity of seeing every inlet on the coast, some of which, bordered by lofty masses of naked granite, are very beautiful. It would place before him, almost in a line, the *Corcovado*, *Gavia*, *Two Brothers*, and other mountains of a singular form, uncouth names, and stupendous altitude. During the morning fogs, which hover about the shore, some of these raise their heads high above the mists, and serve as guides to the port: the Gavia is the most to the west, of the greatest height, and has a remarkable flat top, which seems an immense cube or table of stone, with perpendicular sides, placed upon a mountain. The Corcovado, a little more to the eastward, is a lofty point of rock, which appears to pierce the heavens. Steering for this, when far out at sea, brings a vessel near to the Sugar-loaf, a much lower and conical mountain, with its steepest side to the west. Close to the foot of this rock lies the passage into the harbour.

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* Major Rennell's "*Investigation of the Currents*," pages 137, 8.

"While rounding the isle Pay, or Paya, the entrance is not visible; but, in proportion as the Sugar-loaf draws to the northward of the ship, the gorge opens, and through it is beheld the calm expanse of what is generally deemed the finest bay in the world. The entrance is about a mile wide, and fenced on either side by solid masses of granite, one entire stone without a chink; that on the west is nearly 600 feet high, commonly estimated at much more; its neighbour, on the other side, rears its head to a somewhat greater elevation, and is topped with a signal-staff, from which the first notice is given to the city of approaching vessels. Both hills are very abrupt, and skirted with forts, the advance of which is defended on both sides by strong double curtains. Immediately in front, and a little within the narrowest part of the entrance, is the battery of the Lagé or Lagea, a low square fort, situated upon a mass of naked rocks, against which the water breaks with violence, and, in stormy weather, sometimes overtops the battlements, reducing the garrison to great distress and some danger. The fort of Santa Cruz, on the right hand, is very respectable: but the guns are placed too high, and the water is deep close to the rock, so that small vessels may render them perfectly useless.

"New beauties unfold themselves on proceeding into and up the harbour. At the mouth is frequently a very heavy and sometimes dangerous swell. Foreign ships formerly were obliged to anchor there, in 17 fathoms of water, with a sharp, rocky, and irregular bottom."

The *Baron Roussin* says, the mountain called *La Gavia* is situate about three leagues W. by S. from the entrance of Rio. It is seen from all points of the offing between the east and S.S.W. Its top appears to be flat, and rather larger at its summit than a little way below, which gives it the appearance of a ship's top: hence it cannot be mistaken for any other mountain, and it is the best object for distinguishing this coast. It is situate in latitude 22° 59′, and longitude [*corrected*] 43° 13′. Hereabout the variation of the compass, in 1819, was 3° 43′ E.

At about 8 miles N.E. by E. from the Gavia is the *Paõ de Açucar*, [Sugar-loaf,] the conical mountain of rock, on the western side of the entrance to Rio Janeiro. This rock has been generally considered as the beacon which serves to mark that entrance; but being much lower than the Gavia, it is not seen at so great a distance.*

It is prudent, in general, to keep at some distance from the coast which connects Rio Janeiro with Cape Frio, because, when the wind blows from S.W. to E.S.E. by the South, the swell is incessant, and in rough weather it renders the anchorage very unsafe. You should not approach the islands situate at the entrance of Rio until the sea-breeze is well set in; and then you must manage to reach an anchorage before night. Without this precaution you will be exposed by stopping among the islands, or at the entrance, during the calm which intervenes between the sea and land breezes; or encounter the latter, which directly opposes the entry, and is very often accompanied by gusts of wind, which are sometimes violent, more especially at the full and change of the moon.

If, notwithstanding all precautions, the land breeze should set in before you have entered the harbour, and your vessel sails badly, or if the current, which almost always sets outward, will not allow you to reach the inside of the bay by tacking, it will then be more advantageous to remain outside of the islands than to anchor among them. The space for tacking is very limited, especially during the night; the ground is hard, and the swell of the sea is the stronger and more troublesome the nearer you are to the entrance. The strongest gusts of wind from the land breezes seldom extend farther out than to Redonda or Round Island.

On ENTERING and LEAVING the HARBOUR.—The passage generally preferred on entering and leaving the harbour, is that between the isles Paya and Raza. The first lies at 4¾ miles S.E. by E. from the Sugar-loaf, and the latter 7 miles S. ½ E. from the same. The isles are steep-to, and you may pass close to either. In the channel between are from 21 to 11 fathoms, bottom of gray sand.*

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* Captain Beechey, in H.M.S. *Blossom*, on his way to the Pacific Ocean, reached Rio Janeiro on the 11th of July, 1825, and here he remained until the 13th of August. During their stay the officers measured the height of the *Peak of Corcovado*, which was found to be 2,306 feet above the level of the sea; that of the *Sugar-loaf* 1,292 feet.

Should you enter at a mile to the west of Raza, or midway between Raza and Redonda, you will have the western point of Paya nearly N.E., and a direct course thence N. ½ E. 7½ miles, will carry you to the west of the fortress of *Santa Cruz*, which stands on the eastern side of the entrance. On this track you leave, at a distance to the west, several islets and rocks lying to the N. by W. of Redonda, and pass about half a mile to the east of the islet *Catanduba* or Toucinhos, lying near a mile to the south of the Sugar-loaf. In this route the soundings decrease gradually from 24 to 7 fathoms, bottom of fine gray and white sand, stiff ground. There is no danger, and nothing to avoid but what may be seen.

The entrance to Rio Janeiro, bearing W.N.W.

The least depth of water at the entrance of Rio is 6½ fathoms; having passed this, the depths increase rapidly: in one cast of the lead you may have from 11 to 14 fathoms, very near to the battery of Santa Cruz. You may safely approach still nearer to the opposite side, but the first direction is the most followed, it having the treble advantage of leading a vessel near to the fortress, of answering the signals made therein, and of keeping clear of the little isle *Lagea*, with its fort, on the opposite side of the channel. Thus, also, you will avoid the effect of current, which sometimes runs to the N.W. when the tide is rising.

The passage between the fort of Santa Cruz and that of Lagea is the only one frequented: that between the latter and Point S. Joaõ is never used: not from want of depth, but because it is narrower, and exposed to shifting winds from about the Sugar-loaf and other high lands. Here, also, the current is irregular, and the ground rocky.

From about three cables' length off Fort Santa Cruz the direct course to the anchorage for ships of war is N. 32° W. [*N.* 35° *W.* true] until you are E.N.E. of the fort of *Vilganhon*, which you pass safely at the distance of three cables. From this spot you will steer for the *Ilha dos Ratos*, or *Rat Island*, and having now arrived before the city, you may choose your anchorage in from 19 to 10 fathoms, bottom of mud; only observing not to bring the Sugar-loaf to the westward of Fort Vilganhon. The best place for ships of war is to the E.N.E. of the palace, to the south of an imaginary line from Rat Island to the principal church of the city: the bottom, in from 14 to 18 fathoms, is excellent. Here you will avoid a small rocky bank, lying at 2½ cables, E.N.E. of Rat Island.

The *Isle Cobras*, or *Serpent's Isle*, is the fortified isle to the west of Rat Island. If from the flagstaff of Fort Vilganhon a line were drawn to the Isle Cobras, it would separate the depths proper for large vessels from those of 4 to 2 fathoms, which are frequented only by coasters and merchant vessels.

The anchorage for merchant ships is to the N.E. and adjoining to the city. The larger ones arrive at it by passing the Isle Cobras, and are separated from the Men-of-War Road by a shoal bank, on which the sea breaks at low water, spring tides, when the winds from the offing are violent.

Vessels commonly moor North and South in the Bay of Rio Janeiro; but it seems preferable to moor N.E. and S.W.: this direction, being nearly that of the flood and ebb, renders it easy to lay the vessel athwart the land and sea-breezes, which are almost the only predominant winds. This will in summer be found necessary; for at that season the heat is, at times, almost insupportable. A hawser, carried alternately from one buoy to the other, according to the wind, will gain this advantage, so important for the salubrity of the vessel: the flood-anchor to be on the larboard, and that of the ebb on the starboard side.

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* Between the islets do Paya and da Maya *(the Father and the Mother)* is a narrow but good channel of 11 fathoms, called the *Nereus Channel*, from the name of the ship commanded by the late venerated Captain Peter Heywood.—Ed.

The Land and Sea Breezes ordinarily divide the 24 hours. The first begins in the evening, continues all night, and ends at about nine or ten o'clock in the morning. One hour of calm succeeds this, and generally, at about 11, the sea-breeze penetrates into the Bay and continues until sun-set. The strength of these breezes is not uniform; and at times there are total interruptions; the calm, at times, will prevail for days together, or be varied momentarily by breezes without any fixed direction; but such circumstances are of rare occurrence.

The Tides are not regular, or of equal duration; as the ebb generally runs much longer than the flood, more especially after heavy rains. The ordinary velocity of each rarely exceeds seven-tenths of a mile in the hour; but at times it may run at the rate of a mile and three-tenths, principally during the ebb. The time of high water on the days of full and change is at three quarters past two, and the vertical rise 4½ feet: neaps only 3 feet.

The safety of the anchorage is nearly uniform, and is very rarely disturbed by winds causing serious accidents.

LANDING PLACES, &c.—There are many landing places at the kays before the town. Some are simply slopes or hardways, others have stairs. The convenience of their use depends on the state of the sea, which is seldom so agitated as to impede the communication between the shipping and the shore; but the filth of the town at these places, renders the approaches at all times disagreeable.

Vessels in the Road generally take their water from a large fountain erected on the kay of the *Place do Mar*, before the palace; but this water is not very wholesome, as it frequently causes dangerous colics, in the beginning of its use.

The BAY or rather GULF of RIO JANEIRO is very spacious, and one of the most magnificent in the world. Its extent in diameter is from three to four leagues in several directions between mountains of majestic elevation, covered with the richest verdure, and terminating in an easy declivity, occupied by numerous villages, down to the sea. Plantations of all sorts, handsome country houses, surrounded with trees, many isles, woody and inhabited, ornament and diversify the surface and the coasts of this little inland sea; and there is not on the globe a more beautiful residence, or an aspect more imposing and agreeable.

The anchorages for large vessels do not extend far to the north of the parallel of the city; but all the bay is navigable for a multitude of small vessels or country boats, which form an animated scene.

From observations in the bay the variation of the compass was 3° 40′ E. in June, 1819.

A stay made in the Road, as in most roads subject to a high temperature, causes on the ship's bottom the adhesion of a great quantity of barnacles and other marine productions, which vegetate quickly, and soon cover over all the sheathing; these injure the copper and impede the velocity of the vessel; they must, therefore, be frequently cleaned off.

Fish are not abundant, owing to the number and motion of the vessels; and the consumption of those taken is not safe, a consequence of a great number of vessels being sheathed with copper. Shell fish, and oysters in particular, ought to be avoided.

On LEAVING the ROAD of Rio Janeiro the most simple precautions only are required: it will be sufficient merely to attend to the land-breeze and the ebb-tide, allowing them to carry you along: even the ebbing is not essential if the breeze has that strength which it usually acquires during certain hours daily.

To be better prepared for getting under way, vessels frequently, on the evening before their departure, get on the side of the bay which faces the town, by which they avoid any obstruction in the Road, properly so called; and some take advantage of the strength of the land breeze, but this is not really necessary, for a vessel may easily set out from any part of the usual anchorage.

The route for going out is the same as that for entering: passing at three cables' length to the east of the isle Vilganhon, and at the same distance on the same side of Fort Lagea, and ranging within hail of the fortress of Santa Cruz, taking care in this tract to keep over to the eastern side rather than the other; these are the only requisite precautions.

As you generally weigh anchor in the morning, it is probable that you will have the advantage of the land breeze at least for four hours; this will enable you to pass all the isles in the bay; and having arrived here, you may tack according to circumstances. Should you experience a calm, between the land and sea-breezes, before you get without the islands, it will be proper to anchor, choosing a favorable position so as to get under way again with the first breeze that ensues.

Rio Janeiro, the capital and seat of the Brasilian government, is a large and fine city, of which the population, in 1819, amounted to 120,000 persons. It possesses, in abundance, all the resources which mariners can require. Vessels may here be careened, remasted, and furnished with all things requisite, but all is expensive, and repairs are very dear, on account of the high price of the materials of workmanship. Provisions, though plentiful, are not cheap, cattle excepted; and the flesh of these is not only of indifferent quality and flavour, but frequently unwholesome; a disadvantage common in hot climates, and, in particular, on the greater part of the Brasilian coast.

CAPTAIN HEWETT'S DESCRIPTION and DIRECTIONS are as follow: "The immediate entrance of the harbour of Rio is known by two lofty peaks, one on either side; the western resembles a sugar-loaf: it bears that name, and *differs from every other on the coast*, (for there are many,) by the inclination of its summit to the *westward.*

If night be too far advanced, a preference ought to be given to remaining under way, rather than to anchoring without the harbour, the ground being rocky, and much exposed to a heavy rolling swell, which increases as it approaches the bar, the shoalest water on which is but 6½ fathoms. The certainty of the sea-breeze before noon of the following day, and the tempestuous and general violence of the land-breeze, accompanied by heavy rain, &c., particularly at the full and change of the moon, renders necessary the precaution of standing offand on, from and to Round Island; for to it the violence of the squalls seldom extends.

The FLOOD-TIDE in the HARBOUR is of shorter duration, and of less force, than the ebb, against which and a strong land-breeze our ship, the Inconstant, *turned in*, to the astonishment of the Portuguese; an effort never before attempted. After violent rains, the rise of the water in the harbour has very little influence over the ebb-tide, except diminishing its strength. The ebb has been known to run a whole day without intermission; the current strongest on the western side: but an eddy flood will sometimes be visible on the eastern side, when the water is discovered to rise.

The ENTRANCE of the HARBOUR, between the FORTS SANTA CRUZ and ST. JOAŌ is, in breadth, three-quarters of a mile. The passage between St. Joaō and *Legea* or *Square Island*, situated immediately in the entrance, should never be attempted, although the greatest depth of water is to be found there: the narrowness of the channel, the likelihood of the wind's becoming variable under the Sugar-Loaf, the irregularity of the tide, with the rockiness of the bottom, if compelled to anchor, render it dangerous, if not impracticable. The true channel is on the eastern side of Legea Island, to abreast of which, from the bar, the water gradually deepens from 6½ to 21 fathoms; and, when a little past it, the ship's head being N.N.W., soundings are lost for a short time, with the common hand-line.

Leaving Fort do Vilganhon (also on an island) on the left hand, the best anchorage is obtained *for vessels of war*, abreast the city, with the flagstaff of Vilganhon just open to the westward of the Sugar-Loaf. By taking this precaution, a small bank, very dangerous for cables, will be avoided. This bank is situated about 2½ cables' length from *Ilha dos Ratos*, or Rats' Island, in an E.N.E. direction: it is circular, about a cable's length in diameter, and very rocky: the mark for 4½ fathoms, which is the shoalest water, is Ilha dos Ratos and the Great Church in one, and Vilganhon flagstaff on with Theodosia Battery, on Point S. Joaō: so that its vicinity to Ilha dos Ratos renders precaution necessary in mooring. The best bower, with a good cable, should be laid down to the westward, in order to preserve an open hawse to the entrance; a stream-cable bent on to the small bower-anchor, and taken in at the stern-port, will preserve a free circulation both from the sea and land breezes, and the ship's head will thus be directed to the only points of the compass from which the wind can be expected to blow fresh, and which are from N.N.W. to S.W.

MERCHANTS' ROAD.—*A bar of sand*, with some rocks, extends opposite to the city, the outer edge nearly in a direct line from Vilganhon to Ilha dos Ratos, and ending at the N.E.

N.E. point of Ilha dos Cobras: this bar is passable for boats only; but within it, all merchant-vessels that there is room for, discharge and take in their cargoes: the only passage to it is around the north end of Cobras, near which are the arsenal and Brasilian vessels of war."

DIRECTIONS BY ANOTHER OFFICER.—"In entering the harbour take care to pass within hail of Fort Santa Cruz, in order to answer any questions that may be asked. There is plenty of water close to the rocks. Then proceed up to Fort do Vilganhon; below or opposite to which bring-to, or come to anchor, and allow no boats to come alongside but those of the government, until you have received *pratique,* when you will be permitted to proceed higher up the harbour, round the east end of the Isle Cobras, to the place of anchorage for merchant-ships.

There are no pilots to be met with off the coast or harbour; for, as there is no hidden danger, they are not requisite. Whilst the sea-breeze is strong enough to enable ships to overcome the ebb, they may safely enter by night or by day. But on entering at night the Fort Santa Cruz makes a signal to the city,* which is not to be understood as interfering with the vessel entering.

The port regulations require all vessels to bring-to a little below Fort do Vilganhon; and any one attempting to pass before she has been visited will be fired at, and the commander liable to imprisonment, besides paying a fine for each gun so fired.

Besides the lighthouse erected on the Isle Raza, a small light is put up every night in the fort of Santa Cruz. It has been noticed that the time of high-water is at 2h. 30m. *p.m.,* but it seems very uncertain."

DIRECTIONS for RIO JANEIRO, for vessels approaching from the *southward;* by the BARON ROUSSIN.

The approach to Rio Janeiro is *generally,* as we have shown, by Cape Frio, which is admitted to be correct during the northerly monsoon, and when advancing from the northward or eastward: but under other circumstances, it will be disadvantageous, by losing time and prolonging the voyage.

For vessels from the southward, and during the southern monsoon, the *Ilha Grande,* the *Morro of Marambaya,* and above all the *Gavia,* in the west, are the best objects of recognisance; as all these may be seen at a sufficient distance to serve as a guidance on the route, and an estimate of the distance to the anchorage.

On advancing, another good indication is the peculiar figure of the land, between the Gavia and Sugar-Loaf. When coming in from the offing, between the E.S.E. and S.W., the configuration of their summits presents, in a very remarkable manner, the figure of a man lying on his back from W.S.W. to E.N.E.; whereof the Gavia forms the head, and the Sugar-Loaf the feet. When the tops of these mountains are free from clouds or mists, it is almost impossible not to be struck with this appearance.

The Gavia, as already noticed, is situated at about three leagues W. by S. from the entrance to Rio Janeiro. Its summit appears flat and rather larger than the surface below it, and which gives it the appearance of a ship's top. This mountain and the Sugar-Loaf, at 8 miles to the eastward of it, have been described in page 138.

On approaching Rio Janeiro from the southward, soundings may be obtained at a considerable distance from the land, but at a great depth. At 10 to 15 leagues off they vary from 60 to 80 fathoms, and diminish gradually to the coast; the bottom is a mixture of sand, gravel, broken shells, rocks, and oaze or mud.

GENERAL REMARKS *on* RIO JANEIRO, *by Captain* J. W. MONTEATH, 1824.

"Feb. 29, 1824.—During the night the breeze continued fresh from the N.E.; at sunrise, the high land of Brasil, to the westward of Cape Frio, was in sight, bearing W.N.W.; at this time Cape Frio, although the nearest land, was not visible, being completely enveloped in clouds: these, however, soon cleared away, and the Cape was seen, bearing N.N.E. ½ E., distant 20 miles. The wind here veered more to the northward; we, therefore, hauled in for the land to the distance of two leagues. At 10, bore up, on a W. ½ N. course, the entrance of Rio de Janeiro, (which is easily distinguished by the *Gavia* and *Corcovado Mountains* on the western land,) bearing W. ½ N., distant about 10 leagues; the latitude, by observation, being 23° 7′ S.

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* In 1820, of two guns and two lights.

March 1.—The wind was light, from the eastward: at 2 *p.m.* we passed the Marica Islands at the distance of two miles. At this time the island Redonda was in sight, and presented, owing to the state of the atmosphere and refraction, a most singular appearance; that of a wine-glass inverted.

Between the Marica Islands and the shore there is anchorage, at least for small vessels, as I saw a number of coasting vessels at anchor behind them; in going in they passed round a reef, which extends considerably east of them, and bore up for the anchorage, which is on the N.W. side of the islands.

At 5 *p.m.* we entered the channel between the islands Paya and Raza. At 7, we rounded the islands Paya and Maya, (which lie to the S.E. of the entrance of the harbour,) at the distance of half a mile. The sea-breeze now died away, and the wind became light and baffling; we, however, kept under way, in expectation of passing the fort, with the assistance of the flood-tide, but were disappointed, as the ebb-tide ran strong all night, and also the two succeeding days. At 2 *a.m.* came to anchor with the kedge, the weather calm, and the tide setting strong to the S.W. I should recommend, if the weather appears settled, to come to anchor at once, when the sea-breeze falls off, in preference to keeping under way, among the islands, as I found that the anchorage is tolerably good, and the depth of water from 10 to 14 fathoms. If the vessel has a chain-cable, I would come-to with it in preference.

At sun-rise a breeze sprung up from the S.W.; weighed and made all sail; but, notwithstanding we had a fresh breeze outside, we could not get past the Sugar-Loaf, the high land intercepting the breeze; and it was not until 9 *a.m.*, when the regular sea-breeze set in, that we were enabled to pass Fort Santa Cruz. At 9h. 30m. we were boarded by an officer from Fort Vilganhon, who ordered us over to the other side of the harbour until the visit was paid.

Owing to the disturbed state of the country, no person is allowed to leave the vessel until visited by the officers of police, as well as by the health-visit. The former was not received until next day. Passports are required, and strictly examined. The commanders of vessels, as well as passengers, are subjected to great inconvenience, being obliged to walk with the guard to the superintendent of police' office, a distance of two miles from the landing-place, and afterwards to the judge of police' house, about a mile farther, to be presented. This, I can vouch for, is no easy task; especially in the middle of the day, the heat then being very oppressive.

It is surprising to what an extent bribery is carried on by the officers of government, especially of customs. No business can hardly be transacted without a fee. These, during a vessel's stay, become very expensive, and form a prominent item in the charges of the port.

On receiving the different visits, the vessel is allowed to proceed above Fort Vilganhon. By a late regulation, if you do not intend to discharge all your cargo, you must come to anchor in the outer Road, below Rat Island; if otherwise, you must proceed to the northward of, but not to the westward of, the Isle Cobras, where you must remain until you have been visited and have received a certificate of discharge. You will then shift the vessel to the westward of the channel, between Cobras Isle and the city, where you remain until you have completed its lading."

The PORT REGULATIONS of Rio Janeiro, in 1825, were as follow.

When a vessel arrives, a military guard is put on board, the different government boats visit, and the custom-house boat call alongside, to know whether the vessel is bound to Rio, or has only put in for supplies. If bound for Rio, a strict search is made in the cabin and forecastle, and all parcels found are carried to the custom-house, whence they may be taken, after paying the duty. The hold is then sealed up, and the captain allowed to go on shore to enter, having previously sworn to his manifest or cargo-book, and signed a declaration in Portuguese, of his detention. If his manifest clears the vessel for Rio, she must be entered in full, and pay duty on all her cargo; if for any other part, a time is allowed her to get supplies, and her hatches are not sealed. If she has a cargo to land, she is sealed, and enters in *franquia*, which allows the privilege of landing and selling part of her cargo, only paying duty on the part landed.

If, by any mistake in the interpreter, the captain declares, in the declaration in Portuguese, that he is bound for Rio, although his manifest may show that his vessel is bound to another port, there is difficulty in getting entered in *franquia*. Vessels are allowed but one discharge a day, and often are prevented from discharging, by want of room in the custom-house, or want of guards to attend to the discharge. After a lighter is loaded, the hatches are immediately sealed, unless permission is previously given to the officers to remain, to allow the cargo on board to be stowed, and the vessel's hold to be put in order; for such courtesy a fee is exacted, which, if not given, much trouble and inconvenience may arise, as they are arbitrary in their office, and no redress can be had by complaining; the word of the lowest guard having more faith given to it than that of the most respectable shipmaster. Three officers are sent on board to attend to every discharge; and if one of them fails in appearing no discharge is allowed.

Vessels cannot begin to discharge before daybreak, and the captain is bound to send his boat in time to take off the officers from the shore, or furnish another for that purpose. The expense of the guards at each discharge is about 4 dollars 80 cents; that is the customary fee to secure their civility; a practice of long standing, though pretended to be denounced by the judge or chief of the custom-house, and which merchants cannot avoid paying without exposing themselves and their business to difficulty and inconvenience. All lighters with merchandise must be at the custom-house by seven or eight o'clock in the morning; and, as vessels lie off in the bay small discharges only can be made at a time. Vessels loaded with dry goods are often delayed from ten to fourteen days between each discharge, without an opportunity of discharging or in waiting for their turn.

Goods, although manifested, if found in the forecastle, or any where out of the hold, or not under seal, are liable, by the regulations, to seizure.

DESCRIPTION *of the* INTERIOR *of* RIO JANEIRO, &c.

Lieutenant Shillibeer, R.M., who published in 1817, a very curious and interesting volume, describing the voyage of the *Briton* frigate to the Pacific Ocean, has in that work included a description of this harbour; and he says that, the entrance being narrow, and well fortified by nature, could easily be rendered impregnable. The fort of Santa Cruz may be considered as the principal fortification. The battery at the foot of the Sugar-loaf hill is of considerable extent, but so neglected, like several others alongshore, as to be nearly useless. The city, he adds, derives but little protection from its immediate fortifications; and the Island Cobras, notwithstanding its contiguity, is but little calculated to render it any.

There are wharfs and stairs for the purpose of landing at, but the most convenient is at the great square. The palace here was originally the mansion of a merchant: it is extensive, and has nothing particularly magnificent in its appearance, to indicate its being the royal residence. At the bottom of this square is a very good fountain, which is supplied with water from the adjacent mountains, and conveyed from some distance by means of an aqueduct. The water is not good, and, on first using it, causes a swelling, accompanied with a pain in the abdomen. Ships may be supplied with considerable expedition.

It is almost impossible for a person, possessing the least reflection, to pass this spot without being struck by the contrast which must, necessarily, present itself to him. On the one hand he may contemplate the palace of a prince, surrounded by courtiers and wallowing in luxury; on the other, slavery, in its most horrible state.

Leaving the square, you enter a street of considerable length and width, in which the custom-house, the residence of the British consul, &c. are situated.

The houses are generally well-built, some of the streets are good, but all exceedingly filthy. The shops are well supplied with British as well as all other wares; and, whether the vender be English or Portuguese, he is equally unconscionable in his demand. Most of the streets are designated by the trades which are exercised by those who occupy them. As, in Shoe Street, you find shoe-makers; in Tin Street, tin-men; in Gold Street, goldsmiths, lapidaries, &c. Gold Street is the most attractive, and is generally the resort of strangers, who are anxious to supply themselves with jewellery or precious stones, natural to the country: but it is not always that they are fortunate enough to succeed in obtaining them genuine; for, since the city has become the royal residence, it has attracted a host of English, Irish, and Scotish, adventurers, and the Portuguese are apt scholars in knavery, so that, from any of them, you are now very likely to acquire a bit of paste instead of a diamond. The inns, though better than in many places, can boast of no excellence.

This city contains a considerable number of churches, but they are by no means splendid: and, excepting the chapel royal, which is adjoining the palace, there is little worthy of notice. The theatre and opera are attached also to the palace, but possess no particular elegance. The market is well supplied with every article, and is in so eligible a situation, that, with a comparatively small portion of trouble, it might be kept in fine order; but the people are idolaters to filthiness, and not less slaves to it than to superstition.

The laws are very deficient here, as well as in the other parts of Brasil: without money it is impossible to obtain justice, and with it you can prevent its being administered. The murder of a lay subject is scarcely ever punished; the least insult to the church, or rather to the men of it, most rigorously.

The trade of this port is very considerable, and from various countries. There is a Chinese warehouse of great extent; and, at certain periods, articles from China may be procured at a low rate. The cultivation of the tea-plant has been attempted, but unsuccessfully.

The country, for a considerable distance around, is peculiarly beautiful: the mountains high and woody: the valleys perfect gardens. The most delicious fruits are abundant. The quantity of oranges exhibited for sale, in the orange market, is astonishing. The same tree often exhibits, at once, the blossoms, the fruit in its primitive state, some half ripe, and the rest fully so, or fit for use. The pine apple is here in great perfection. In the neighbourhood are several botanical gardens, belonging, chiefly, to private individuals, and containing many plants rarely to be met with in England.

The naval department of the government is not extensive; but in 1814, when his Majesty's ship Briton was here, several sail of the line were in commission, and five of them, with some frigates and corvettes, were ready for sea. Many others, of various classes, were moored off the arsenal, which is of some extent, and situated near the island Cobras.

The harbour of Rio Janeiro is spacious; and, were the heat less oppressive, it might be esteemed as one of the most desirable in the world. There is a breeze from the sea generally about noon, which cools the atmosphere and renders it endurable.

Notwithstanding that the entrance is so narrow, the harbour increases to the width of three or four leagues, and in this gulf or basin are numerous small islands, some of them containing villages, others gentlemen's seats only. The greater part is shallow; so that, at a small distance above the island containing the British Hospital, it is not sufficiently deep for a vessel of any burthen to pass: but great trade is carried on by means of large boats. The whole of the islands in the gulf are very picturesque.

The DISTRICT of BRAGANZA, situated immediately opposite to the city of Rio, or St. Sebastian, is, also, very fine. It contains the small town of Braganza and a few villages along the coast. Sir Sydney Smith has here an estate of considerable extent, which was presented to him by the late King of Portugal, in compliment for his services to the Royal family and court.

The British frigate *Alceste* visited this port on her passage to China; and in the journal of her voyage* we find the following animated description of Rio Janeiro.

" An opening between two extremes of land marks the entrance of the harbour; and here, on the right, is the Fort of Santa Cruz, and, on the left, that of St. Joaõ. The ranges present in some places conical summits; and, although one has especially obtained the appellation of *Sugar-loaf*, it is rather from its superior precipitous height, than from being singular in its shape. At this distance, the beauty of the scenery is derived principally from the extent and impressive variety of the forms assumed by the different ranges.

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* Journal of Proceedings of the late Embassy to China, by Henry Ellis, Esq. London, 1818.

Mountains, whose relative distances are marked by the position of the clouds resting upon their summits, form the back-ground. Mr. Ellis says, on approaching nearer to the entrance, the scene became indescribably sublime and beautiful; the mountains that had formed the amphitheatre, on a nearer view, divided themselves into islands and separate headlands; several were thickly, though, perhaps, not loftily, wooded. Fortifications, detached houses, villages, and convents, occupied different positions; the eye wandered in rapturous observation over an endless variety of picturesque combinations, presenting a totality of wondrous scenery, the general effect of which must equally defy pictorial and verbal description.

"*St. Sebastian*, or the city of Rio Janeiro, when viewed from the church of the same name, appears to be built in a semi-circle; the streets are generally at right-angles. The public buildings are neither numerous, nor deserving of notice in point of architecture. The population is estimated at 120,000 souls, two-thirds of which are slaves, and the remainder consists of Europeans and mulattoes. The agricultural and other severe labour is almost entirely performed by slaves; for, until very lately, not only Europeans, but mulattoes, considered themselves degraded by such employments. The mechanics were formerly all mulattoes; at present, however, the residence of the court has encouraged not only Portuguese, but other Europeans, to establish themselves as artificers.

"Thirty or forty English mercantile houses are established at St. Sebastian, and the export-trade is almost entirely in their hands: their imports consist in English manufacture, and all the produce of Europe which can be required in Brasil: their exports from St. Sebastian are sugar, coffee, and hides; the cotton of Pernambuco being so superior, that but little of this commodity is grown in the neighbourhood. Rio coffee holds the third rank in the European market. Brasilian merchants are the growers of the raw produce, which is conveyed by them to the port, where it is sold to the English exporter. The customs at the port of St. Sebastian are stated to amount to £2,000,000 per annum."

In the Relation of the Voyage of *Capt. Wm. F. Owen*, in 1822, it is again stated, the country around Rio presents not only the most varied and majestic scenery, but is entirely a garden of nature; every spot, even of the soil-less rock, being covered with beautiful flowers.

"On entering the harbour," says Mr. Forbes, the lamented botanist, "the mind is at once struck with its magnificence and beauty. The vast expanse of water bordered with bright green, the numerous inlets and islands, the rich verdure of the hills, studded with villas, and the lofty chain of mountains, form a dark and distant back-ground, and make, altogether, a picture more like the poet's fancy than a reality of earth."*

The land here is rich and well cultivated, and the oranges are perhaps the finest in the world. There is a peculiarity in the formation of these not generally known; it consists in the part where the seeds are formed being removed near the crown, and in some instances outside the pulp, but beneath the rind, giving it, upon the peel being removed, the appearance of two oranges. The part containing the seed is a kind of excrescence into which is drawn all the objectionable portion of the fruit, leaving the legitimate production free from every impurity, and rendering it the most delicious in its kind. (See upon this subject, page 118.)

Bota Fogo, about three miles from the city in a southerly direction, is one of those beautiful inlets of which there are so many in the harbour of Rio Janeiro, and is the residence of many of the principal families, particularly the English merchants, who all have villas, either in the neighbourhood of Bota Fogo or Gloria. The scenery is extremely fine, commanding a view of the mouth of the harbour. Before vessels cross the Bar they are seen by the inhabitants of Bota Fogo or Gloria, and again when they get inside the harbour, after passing the Sugar-Loaf and the three forts that command the entrance.

The aqueduct, or covered water course, that supplies the city, is a pleasant walk, and commands many fine and extensive views.

VI.—RIO JANEIRO TO SANTOS.

MARAMBAYA ISLAND, which begins at nine leagues to the westward of the entrance of Rio de Janeiro, is twenty miles in length, and forms the large *Gulf of Marambaya*, which abounds in fish. Of this gulf the general depths within are 3 and 4 fathoms. It is bounded on one side by the main land, and on the other by the *Restinga* or Island. The latter is a narrow bank of sand, about twenty feet above the level of the sea. In most parts, especially near the middle, it is quite bare, in others it is covered with various creeping plants, which keep the soil together; it exhibits on its summit a little brush-wood, and at its northern extremity some mangrove. Toward the sea it is steep, and the surf breaks against it with violence; toward the bay it is level and smooth. The latter portion abounds with shell-fish and sand-larks; the herbage shelters many armadilloes; and deer, with other animals of chace, present themselves to the sportsman.

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* A description of the town and environs is given in the narrative of Captain Owen's Voyage, Vol. I. p. 38.

MARAMBAYA, at the western end of this sandy track, is a single bold mountain, about 700 feet high. It has a church and some good springs. The inhabitants subsist by fishing and the produce of the few fields which they cultivate, without having much to spare.

Immediately off the east end of the Praya de Marambaya, is the great point of *Guaratiba*, at which begins the range of mountains that surround the Gulf of Rio Janeiro. From this point, in clear weather, at 7½ leagues to the east, may be clearly seen the isle *Redonda*, off the entrance, and the steep shores, in streaks of white and dark green, which terminate the coast. You may equally see, at about six leagues to the E.N.E. the *Gavia*, the mountain, which, from its remarkable form, cannot be mistaken for any other, and which is the surest indication of Rio Janeiro, on approaching from the southward. On proceeding thence toward Rio, no particular caution is required, and having come up nearly to Redonda, you may shape a course, according to the wind, between it and the neighbouring islets: recollecting only, before entering, that it is requisite to have a wind which will carry you in before night; such wind commences about noon, the time of day when the breeze sets in from the offing, almost always with sufficient force.

The eastern point of Marambaya Island is separated from the main land by a small opening, through which boats only can enter into the gulf.

As the land of Marambaya is low, it should in thick weather be approached with caution. Circumspection is the more necessary, as a *Lagé*, or flat rock, surrounded by shoal ground, lies at 3 miles from shore, nearly off the middle of the isle, which should not, therefore, be approached nearer than to 4 miles, or in 22 to 30 fathoms of water, bottom of sand and gravel.*

M. Roussin, both in his chart and directory, describes the Gulfs of Marambaya and Cairosu under the general name of *Baie de Ilha Grande*, which he describes as having two entrances; the one to the east formed by the Ilha Grande, and promontory or beach of Marambaya, and the other by the same isle and Punta Joatinga. Both entrances have sufficient water for the largest ships. Entire fleets may enter and find shelter from all winds. The soundings vary from 27 to 6 fathoms, in great part of the surface: and, on several parts of the interior coast, wood and water may easily be obtained.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude W.			Longitude S.		
	°	′	″	°	′	″
Lagé de Marambaya; a flat rock	23	7	47	43	48	40
Morro of Marambaya; summit (700 feet)	23	5	9	43	59	41
Isle of Jorge Grego; S.W. point	23	15	11	44	10	49
O Papagaio; summit of the large isle	23	10	55	44	12	30
Point Acaya on Ilha Grande	23	15	12	44	20	35
Point Joatinga; summit of the islet	23	18	30	44	30	10
Hill of Cairoçu; Eastern summit	23	20	2	44	34	26
Peak of Parati; summit	23	19	28	44	45	11
Isles Couves; the largest	23	25	54	44	49	1
Ponta Grossa	23	28	15	44	58	27

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* As *Lange* or *Lagé* means a flagstone, and is a generic name given by the Portuguese to flat rocks, but little above the surface of the water, we presume that the 18 feet on this rock, as denoted in a late chart, must signify 18 feet high *above* the level of the sea.

Isle

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
Isle Vittoria; summit	23	47	42	45	44	57
Busios Isles; the S.E. Isle	23	44	27	44	57	11
Ilhas dos Porcos; Southern hillock	23	33	38	45	1	26
Islet Mar-Virado; summit	23	34	7	45	5	27
Ponta das Ostres; extremity	23	34	52	45	8	31
VILLA BELLA de PRINCESA; the steeple	23	46	52	45	17	30
——————————; Roadstead	23	47	26	45	18	30
Point Pirasonungo, on St. Sebastian's	23	57	32	45	11	40
Point Seputuba, on the same	22	56	3	45	20	55
Montaõ de Trigo, or the Corn-stack	23	51	4	45	43	10
Alcatrasses; the largest	24	6	5	45	39	15
SANTOS; the arsenal	23	55	51	46	16	33
———; summit of the Moela	24	3	6	46	12	54
Point Taypu at the entrance of Santos	24	1	11	46	21	43
Laage de Santos	24	18	0	46	9	0
Redonda, or Little Queimada	24	21	26	46	46	0
Queimada Grande	24	28	21	46	38	0

The **ILHA GRANDE**, an island 5 leagues in length, separates the entrances of the extensive harbours of MARAMBAYA and GAIROSU, as shown on the Chart. The interior land is high; and the greater part of the coast presents a double range of mountains. On leaving Rio, when bound this way, the mountain of Gavia serves as a guide to the westward. A sufficient offing must be given to the land after passing this point, as the current frequently sets strongly on the shore, to the west.

The eastern end of the ILHA GRANDE lies at the distance of 47 miles from Point Gavia, and opposite to the bluff point of Marambaya Island. The channel between it and the latter is 5½ miles wide, and very safe for ships of any size, which may take shelter here. The soundings are from 15 to 9 and 7 fathoms. Fresh water may be obtained from the springs at the west end of Marambaya Island, and wood may be had from the other islands in the bay.

On the eastern side of the Ilha Grande is anchorage, in the several little bays named *Palmas*, *Albroo*, and *Eschella*, for ships of any burthen. The first of these, from the East, is Palmas Bay, and in this a ship may lie land-locked in from 6 to 8 fathoms. The other two are smaller, in both the depths are from 5 to 7 fathoms.

Within the Restinga or Isle of Marambaya, the soundings eastward diminish from 8 to 3 and 2 fathoms. From the *Punta do Sena*, or N.W. extremity of the isle, a reef or tongue of sand extends nearly three miles N.N.W. or about two-thirds over the entrance, toward an islet called the *Gavia Grande*, which lies at the entrance of an opening near the north shore; so that the deep channel for ships is only one mile in breadth, and the course upward is between this isle and a groupe to the eastward, of which *Jaguano* is the chief. The best passage toward the eastern part of the gulf is made by keeping the main land on board, leaving the Jaguano groupe on the starboard side, and the two islands *Tacurucu* and *Madeira* on the larboard. There is anchorage at a mile and a half, S.E. ¼ S. from the *River Taguai*, in 5 or 6 fathoms, muddy ground, with the island Madeira W.N.W. ½ W., 2¼ miles, Tacurucu W.S.W. ¼ W., and Mount Marambaya S.W.

On sailing outward from this spot, keep the main land on board, and pass between Tacurucu and Fortada, or the N.E. isle of the Jaguano groupe. You may freely stand toward the Gavia Grande, but must be cautious in advancing toward the bank of Marambaya, proceeding in not less than 9 or 10 fathoms, as the edge of that bank is very steep.

ISLE of JORGE or GEORGI GREGO.—At about two miles from the south side of Ilha Grande, is the islet of *Georgi Grego*, which is bold-to; and, although steril in appearance, it affords not only anchorage on its north side for large ships, but plenty of wood and water: and here, at a village named *Angra dos Reis*, refreshments may be obtained.

GAIROSU BAY.—The entrance to this place, between the Ilha Grande and Punta Joatinga, may be readily known by a remarkable inland hill to the northward, called the

Friar's

Frier's Hood: bring this hill to bear N. by E. ½ E., and steer toward it, until you are 2½ miles within the point of the island, when you may bring up and anchor. By keeping within this distance from the island on the east, you will avoid a sunken rock which lies nearly in the middle of the entrance. On coming in, numerous isles, inclosed within the bay, will be seen; and between those on the east is a passage into the Gulf of Marambaya. The principal village, *Villa Grande*, is on the N.E. shore. The situation of an islet near Point Joatinga, on the west side of the entrance, is latitude 23° 18′ 30″, longitude 44° 30′ 10″.

The Point of Joatinga, and that of *Cairoçu*, which follows, at 5 miles more to the S.S.W., are high and steep, and may, therefore, be approached with safety. The points terminate the south part of the high lands which encompass the great bay of Ilha Grande, &c.

The PORCOS, &c.—At 25 miles S.W. by W. ½ W. from Point Cairoçu is a groupe called the *Porcos*, or *Hogs' Isles*, which comprehends one isle of moderate height, with three small islets, one on the south, the others to the N.E. Between the larger isle and the continent is a very fine channel, into which large vessels may enter and pass with perfect safety, but they should not venture in with a shifting wind. On several points of the coast within, cattle and refreshments, with wood and water, may be obtained. One of the best roadsteads hereabout is in a cove of Porcos, with 8 and 9 fathoms of water, sheltered from all winds, excepting those from N.E. to E. by N., which seldom continue so long as to cause a heavy sea. Here the tide is scarcely perceptible. Opposite to the Ilha de Porcos is the *Bahia de Tubaroes*, or Sharks' Road, which has likewise good and clean ground, and is capable of admitting ships of burthen, but it is exposed to winds from the southward, which raise a heavy tumbling sea, dangerous to large vessels.

ST. SEBASTIAN, &c.—The N.E. point of the Island of *San Sebastaõ*, or of *St. Sebastian*, is 13 miles S.W. by S. from Porcos, and there lie in the offing a groupe of three islets, called the *Busios*, and an island, *Vittoria*, nearer to St. Sebastian. The Busios lie at 11 miles S. by E. from Porcos, and at 6 miles W. 31° S. from these is the Isle Vittoria. The passage is clear for vessels of all dimensions between these several groupes, and so is all the basin formed between the Island of St. Sebastian and the continent, with the exception that the channel between St. Sebastian and Vittoria is contracted by a reef extending 2 miles S.S.W. from the latter, and therefore vessels of more than a middling draught should not attempt it.

The Island of St. Sebastian, in its greatest extent, is about 4½ leagues in length, and its mountains are as elevated as those of the continent, from which it is separated by a gullet or strait. In clear weather this island may be seen at a distance of 15 leagues. Its shores are very steep: that of the south trends to the W.N.W. from the S.E. point of the isle. The eastern coast is, altogether, nearly in the direction of the meridian, and the isle is in form quadrilateral. The western coast, opposite to the continent, forms, with the latter, the gullet, and several deep bays, wherein there are excellent anchorages, bottom of oaze or mud, and depths of 7 to 22 fathoms.*

Those who are bound to St. Sebastian have seldom occasion to land, at any time, either on the north or the south shore of the island. What has been already said on the winds and currents off the coast, has shown what precautions are requisite on approaching. There are impediments which may not be expected; and the Baron Roussin has shown that, even in the month of June, which is the middle of what is called the Southern Monsoon, having made the island from the south, he lost three days in tacking, in order to gain its north side; the winds being adverse and very fresh from the N.E., while the current was running to the south, at the rate of seven-tenths of a mile in the hour. The most prudent way seems, therefore, to be not to attempt the approach from the southward, unless the weather proves fair, when the land may be seen and known.

Point Pirasonungo, the S.E. point of the island, is situate in latitude 20° 57′ 32″, and longitude (*corrected*) 45° 11′ 40″.

The gullet or strait of St. Sebastian affords shelter and refreshments for the largest vessels. All should enter it from the northward, and keep near the island. Its general direction, half-way down, is S.S.W. ½ W. and thence more westerly. It is contracted by a bank extending from the continental coast on the west, for more than two-thirds of its length from N. to S. A particular plan of it is given on the chart, on reference to which it will be seen that, in the roadsteads, on the island side, the depths are from 15 to 18, and that the depths in the channel vary from 10 to 20 fathoms: the bottom of muddy and tenacious ground. The greatest breadth of the strait is at the north part, 3 miles; but two-thirds of this space is occupied by the bank on the west, over which the depths are from 5 feet to 3 fathoms.

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* In noticing this quality of ground, we may here observe that, on the coast of Brasil, the bottom of oaze, or soft mud, is almost always found near the high lands.—*Roussin.*

A roadstead more tranquil than that of St. Sebastian cannot be required; it being so protected by the surrounding high lands that vessels lie in water as smooth as in a basin.

At this island cattle, poultry, arrack, and the other provisions of tropical climates, may be readily obtained, at a moderate price, either at the two principal establishments, or at the habitations of the country people, which are numerous, both on the island and the main. The fishery here is rarely productive, but the fish are of good quality.

The antient town of St. Sebastian is on the continent, at the narrowest part of the strait. Since 1817, the Brasilians have projected a new town on the isle, toward the northern entrance, *Villa Bella de Princeza.* At 400 fathoms to the S.W. of this town is the best anchorage for ships of war, where there are 16 fathoms of water, bottom of grey sand.

There are several *Watering Places* at St. Sebastian, but the best is between the new town and the *armaçao*, or oil factory, situate near the N.W. point. The water is good and easily obtained. On all the coast of the continent opposite, fire-wood is abundant.

The *Winds* at St. Sebastian almost always follow the direction of the gullet, night excepted, when the land breezes come alternately from different points, without any certain law. During the day the winds come mostly from the N.N.E. and S.S.W., following the line of the coasts; they are frequently interrupted by intervals of calm.

The *Currents* follow the same direction as the winds, and their velocity is proportioned to the force of the latter. The most ordinary rate in the gullet is seven-tenths of a mile in the hour, and of one and eight-tenths when augmented to their greatest strength.

The Roadstead is situate in latitude 23° 47′ 26″, longitude 45° 18′ 30″.

It has been noticed that the lands of St. Sebastian, with those of the vicinity, are very high; but they are well covered with wood to their summits, and present an agreeable aspect. The shores are steep, and you may anchor at a short distance from them on good ground. In general there are no dangers but what may be seen.

The south entrance of the gullet is not above a mile wide, but it will admit ships of war, and afford shelter during a S.E. gale. On a survey of the Strait, by Mr. Warner, there appeared to be little or no regular set or rise and fall of tide here; but the current with northerly winds set to the southward, and with southerly winds to the northward, as already described. There may, however, be a rise of 2 or 3 feet on the days of full and change, on which the time of high water has been estimated at 11 h.

St. SEBASTIAN to SANTOS.—From the S.W. end of St. Sebastian, an islet, *Moela*, near the entrance of the port of Santos, bears W. by S. 15½ leagues. In the great bay between, at 5 miles from shore, lies a high conical islet, woody to the summit, called *Montaõ de Trigo*, or the *Corn Stack*, in latitude 23° 51′ 4″, longitude 45° 43′ 10″. At 2 or 3 miles around it, and to the same distance from the coast in the vicinity, is an excellent muddy bottom, having over it from 11 to 22 fathoms of water.

The groupe called the *Alcatrasses* or *Cormorant Isles*, lies at 16 miles S.S.E. [*S.* 17° *E.*] from the Monton de Trigo. This groupe is composed of several arid rocks, the largest of which may be seen at the distance of seven leagues; it appears from the E.S.E. in the form under which painters represent a dolphin, whereof the head, connected with two small rocks, turns to W.S.W. Another rock, larger than the two last, lies at two miles to the W.N.W., and two or three others lie nearly at the same distance to the N.E. The pilots say that the bottom near these rocks is not clear, and that it is imprudent to approach them within 4 or 5 miles, unless the wind be fair. This precaution is the more requisite, as the currents from the gullet and eastern side of St. Sebastian at times affect the sea hereabout. The assigned position of the principal isle of the Alcatrasses is, lat. 24° 6′ 5″, long. 45° 38′. From the northeasternmost of these islets the *Point Sepatuba*, or S.W.

point of St. Sebastian's, bears N.E. ¾ E. 15 miles; and the entrance of the Port of Santos nearly west, 13 leagues.

SANTOS.—As a particular plan of this harbour is given on the chart of the coast, a prolix description is unnecessary. On reference it will be seen that the outer part is a circuitous Bay, with a sandy beach, affording anchorage and shelter; perfectly clear and safe. The port, formerly much used by the Portuguese fleets, has sunk into comparative insignificance, together with the other southern ports, since the rise of Rio Janeiro, Bahia, and Pernambuco. The harbour is formed, on the east, by the island of St. Amaro, a portion of land separated from the continent by a small river, the *Bertioga*, which falls into the sea in that direction, in the parallel of 23° 54′ S. Through this river craft may still pass into the harbour of Santos.

The Southern or chief entrance to the port of Santos admits large vessels, which may enter and be sheltered from all winds excepting those from S.S.W. to S.E. *Point Taypu*, on its western side, lies in lat. 24° 1′ 11″, long. 46° 21′ 43″. The opposite point, *Manduba*, lies nearly on the same parallel, at a mile to the N.W. of an islet named *Moela* or the *Gizzard*, which may be approached with safety.* On advancing into the Bay, from the Southward, you will have 10, 9, 8, and 7 fathoms of water, until near the Bar, upon which there are only 4½ and 5 fathoms. The passage within is narrow, but the eastern side is the boldest, having deep water close to the shore. At six miles up the river, on the eastern shore, and above the second Bar, is a fort, upon a perpendicular rock, near which is a depth of 18 fathoms. Having arrived to this place you will see the town of Santos to the west, on steering toward which, at two or three cables' length from shore, you will avoid the bank stretching from the north side; and, when nearly up to the town, you may anchor. The best spot is abreast of the town, in 7 fathoms, bottom of mud. Provisions are abundant here, and good water may be obtained by sending a boat about seven miles thence up the river.

To the southwestward, between the Port of Santos and the village of Conceiçao, a distance of nine leagues, the shore is generally low; but a chain of high mountains extends within, which branch in different directions, and appear in the distant offing like islands. The chain is broken by the harbour of Santos, but continues to extend thence eastward to the gullet or Strait of St. Sebastian.

Lagé or Rock of Conceiçaõ.—At seven miles E. 25° S. [*E.* 31° *S.*] from the village of Conceiçaõ stands an insulated rock, about 12 feet high above the sea, which appears to be a little larger than a man of war's launch, and at a little distance from it are 12 fathoms of water, bottom of soft sand. From this place the port of Santos may he distinctly seen, at seven leagues to the N.E.

The Lagé or Rock of Santos, otherwise called *Bird Isle*, is a block of smooth stone, about 6 feet high above the sea. It lies in the latitude of 24° 18′, at 16½ miles S. 20° E. from the islet Moela: between it and the port of Santos the depths are 15 to 18 fathoms, bottom of sand and mud, the usual quality of ground hereabout.

Redonda, or Little Queimada.—This is a small round islet, thickly wooded, and visible 20 miles off. It lies at the distance of 10 miles S. 30° W. from the Lagé of Conceiçaõ, in lat. 24° 21′ 26″, long. 46° 46′.

The Queimada Grande is a large rock, nearly barren, lying at about 10 miles to the S.E. from Redonda, in latitude 24° 28′ 21″, long. 46° 38′. This islet has appeared in some charts under the name of Ilha Redonda, but this appears to be wrong; as it is described as long and narrow, extending about N.N.E. and S.S.W. nearly two miles, with a reef from its northern point. Its highest part, appearing of a round form, is to the S.W.†

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* A Light is said to be kept by night upon this islet. Particulars to us unknown.

† A Rock, stated to lie in 25° 41′ 20″ S. and about 44° 50′ W. (*corrected*) was discovered on the 13th of February, 1811, by *Medeiros*, a Pilot of Bahia, who was for about a year along with Captain Roussin, and in whom Capt. R. considered all confidence might safely be placed. It is marked *doubtful* on the chart, but, if it exists, it lies about *S. by E.* true, 35 leagues from the S.E. end of St. Sebastian's.

VII.—SANTOS

VII.—SANTOS TO THE RIO DE LA PLATA, INCLUSIVE.

Having described the Islets in the Offing of Santos, we now proceed with the coast from Conceiçaō southward.

Conceiçaō is situate on a hillock near the shore, and at four miles from it there is anchoring ground with 9 to 11 fathoms of water.

The coast hence, a low sandy shore, trends to the S.W., 14 miles, to the creek, heights, and beach, of *Piruibe;* thence follow, in succession, the islets and point of *Guaraha*, the little river *Una*, *Point Jurea*, the *River Iguape*, the entrance of the *Mar Pequeno de Iguape*, and the port of *Cananea.* The soundings along shore generally increase in depth according to the height of the lands; and there may be found, at from 3 to 10 miles off shore, 7 to 13 fathoms of water. You may anchor off any part of the shore, at two or three miles from the beach, on an excellent bottom, in from 5 to 9 fathoms; but as there are no harbours for large vessels, there can be no motive for anchoring here, unless in a calm, when not exposed to danger.

The Entrance of the little river *Iguape* lies in the latitude of 24° 35½′, and the bar of the *Mar Pequeno* is about 3½ leagues to the S.W. of it, in lat. 24° 43′. By the *Mar Pequeno*, or *Little Sea*, is meant a natural canal, which extends in a parallel direction with the shore to the Port of *Cananea;* and the beachy coast between is, therefore, that of an island; this is called the Praya or Beach of Iguape. In proceeding along it, a vessel should not advance nearer than two leagues, nor into less than 9 to 11 fathoms of water, sandy bottom.

The Mar Pequeno de Iguape, above mentioned, has a sufficient depth for large vessels, but its bar will admit boats only. The town is situate on the western bank, at 4 miles above the entrance. The Praya is a low sandy flat, the middle part excepted, and can be seen but a little way off. Its extent is ten leagues, and it consists mostly of sandy downs, interspersed with brushwood.

Mount Cardoz, which is the highest mountain on this part of the coast, is situate in latitude 24° 58′ 45″, long. 48° 3′ 50″. Notwithstanding the shortness of the distance and the height of the chain of mountains of which Mount Cardoz constitutes a part, and predominates so remarkably, the fogs that prevail on this part of the coast, in the southern monsoon, obscure the land, and the coast should then be approached with great caution.

POSITIONS OF THE PRINCIPAL POINTS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
CANANEA; Islet Bom Abrigo	25	6	49	47	49	0
Figueira Island; centre (160 feet)	25	21	29	47	59	10
Isle do Mel; Southern summit	25	32	43	48	17	30
PARANAGUA; Fort on the Bar	25	30	14	48	17	45
———; West point of Cotinga Isle	25	29	50	48	27	30
———; Church of Sta. Antonina	25	25	42	48	37	30
Coral Rocks; the largest	25	45	49	48	20	35
Itacolomi Rocks: the largest	25	50	20	48	24	9
Morro Caiuva	25	49	30	48	32	53
Point Joaō Diaz, on the S. side of the Rio S. Francisco	26	6	33	48	31	11
Tamborete Isles; Southern isle	26	20	54	48	30	15
Isles Remedios; Southern isle	26	29	28	48	33	14
Point Itapacoruya: North side	26	47	18	48	35	36
Mount Zimbo, on the continent	27	11	6	48	33	25
Volage Bank; 14 fathoms	26	44	0	48	5	0
ISLE of ST. CATHARINE and OPPOSITE COAST.						
Arvoredo Isle; the summit	27	16	47	48	20	0

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
The Fort Sta. Cruz d'Anhatomirim	27	25	32	48	32	22
San Miguel: the church (On the continent)	27	27	15	48	33	38
San Antonio: the church (On the island)	27	30	17	48	26	35
Town of Nossa Senhora do Desterro	27	35	25	48	29	16
San José; the church (On the continent)	27	36	18	48	33	26
Le Ribeiraõ; the church (On the island)	27	42	18	48	30	35
L'Anceada do Brito; the church	27	46	15	48	35	6
The Isle dos Cardos	27	48	38	48	31	53
South Fort, on the Isle of N.S. da Conçeicaõ	27	50	9	48	31	35
Islet Badejo	27	26	6	48	17	36
Isle Aranhas; the largest	27	29	42	48	18	12
Isle Xavier	27	37	18	48	20	24
Isle Campexe	27	42	12	48	24	54
Moleques do Sul; the largest	27	49	49	48	22	34
Isles Tres Irmaos, or Three Brothers; Eastern Isle	27	50	10	48	26	9
Point Catheta	27	35	34	48	22	0
—— Grossa	27	48	18	48	26	36
—— de Lagohina	27	46	18	48	26	37
—— dos Frailes (Friars' Point)	27	50	0	48	30	36
—— dos Naufragados	27	49	47	48	31	19
—— Pinheira	27	53	8	48	37	37
Isle do Coral	27	55	10	48	29	13
Cape Guaratuba	28	6	12	48	34	52
—— Cirui	27	59	12	48	34	10
—— Uvidor	28	12	24	48	34	52
Islet Tocoromi	28	19	29	48	30	30
Point Viraquera	28	13	25	48	33	48
Isle das Araras	28	18	0	48	31	32
Point Bituba	28	16	5	48	33	30
Isle Lobos de la Laguna	28	24	36	48	40	4
Morro da Barra	28	29	18	48	44	52
Town of Laguna	28	28	23	48	45	24
Cape Sta. Marta Pequeno	28	38	32	48	45	40
—— Sta. Marta Grande	28	39	0	48	41	56
Barra Velha	28	51	30	49	11	9
As Torres	29	28	0	49	54	54
Praya or Beach of Fernambuco; Eastern part	29	52	0	49	54	0
—————— of Destretto; Eastern part	31	12	0	50	35	0
Rio Grande de S. Pedro; the tower	32	7	20	52	4	30
Bank of Sand and Shells; Eastern part	33	44	0	52	26	0
Los Castillos; Eastern Rock	34	24	30	53	36	14

CANANEA.—An islet, Bom Abrigo, in latitude 25° 6′ 49″ and long. 47° 49′, distinguishes the entrance of the Port of Cananea. It is very high, covered with trees, and vessels may anchor at a little distance from it to the eastward; a smaller islet lies on the south side of it, two miles to the eastward of which are 10 and 11 fathoms of water, over a bottom of sand. The common channel into the harbour is to the northward of Bom Abrigo, although obstructed by several shoals, but the southern channel is the deepest; and a vessel may venture into either with the assistance of a pilot. The bar may be found by mean of Mount Cardoz, situate inland about 5 leagues to the W.N.W., and by the Praya de Iguape, which we have described. Within the harbour the Brasilians construct large vessels. The town is situate on the western side of the river, at seven miles above the Ilha do Abrigo.

On proceeding southward from Bom Abrigo, you will see, at the distance of 10 miles from that isle, an islet, *Castillo*, 32 feet high above the water, and nearly opposite to the mouth of a rivulet, *Arrapira*, no longer navigable. At 8¾ miles beyond this, in the same direction, is another, *Figuiera*, 160 feet high; both have obtained their names from their peculiar appearance;

pearance: the first being less elevated than the latter, but seeming broader, with a ridge rising up in the middle, and at a distance resembling a castle. Figuiera in shape resembles a fig; both are nearly barren, and bear from each other S. 28° W. and N. 28° E. (*by compass*). At the distance of a mile from each are from 13 to 9 fathoms, fine sandy ground.

PARANAGUA.—The *Isle do Mel*, or Honey Isle, marks the entrance of the Gulf of Paranagua, which is surrounded by forests. This gulf, improperly called Bay, is a break of the land in all directions, within a circuit of five leagues, and is the receptacle of waters from several brooks and rivulets. The entrance is sheltered and divided into two passages, by the isle above-mentioned; this isle is low, and has several hummocks on it, which at some distance resemble islets. To the northward of it are three islets, named the *Palmas.* The southern passage, obstructed by breakers, is not navigable; the northern admits brigs, many of which are built in the gulf or basin. In entering by the northern passage, you leave the Palmas on the starboard side; these may be known by the palm trees with which they are covered; but here a pilot for the interior navigation is indispensible.

The water which issues from the Gulf of Paranagua carries into the offing the alluvion of the country, which has sensibly reduced the depth, but there is nothing material to obstruct the navigation, and at two leagues from the entrances there is found from 5 to 8 fathoms of water, with bottom of grey sand and mud.

The summit of the southern hummock of the Isle do Mel is in latitude 25° 32′ 43″, longitude 48° 16′. Variation of the compass, 7° E.

The town of Paranagua is on the south side of the gulf, within the west end of an isle, *Colinga*, 4½ leagues from the entrance; and there is another town, the *Villa Antonina*, on the western inlet, 2½ leagues higher up.

RIVER GUARATUBA.—The bar of the River Guaratuba is 23 miles to the S.S.W. from the Isle do Mel, at the entrance of Paranagua. This bar lies at the southern extremity of a shallow bank, over which boats may pass, and which extends from the shore eastward to the distance of 3 to 8 miles. The bank begins at the southern pass of Paranagua, and on the edge of it, in lat. 25° 47′, is an islet, called *Ilha do Coral*, 64 feet high, and more to the southward two islets, called the *Itacolomis*, 21 feet in height, and lying in lat. 25° 50′ 20″ and long. 48° 24′. You may approach them from the offing to one or two miles, where there may be found 9 to 11 fathoms of water, bottom of sand and mud. The stream of the Guaratuba is rapid, and the vicinity has been noted for its fisheries. Several small rivers run into it, the principal of which is said to be navigable for 12 leagues.

Between 26° 7′ and 26° 24′ S. is the Island of *San Francisco*, which forms two branches of the river of the same name; the only considerable and important river hereabout. The country here, though rich, is swampy and unhealthy, and the coast generally flat, but rising inland to lofty mountains.

At 16 miles S. by E. from the mouth of the Guaratuba is the point of *Joaõ Dias*, the north point of the Island of S. Francisco, and which forms the eastern extremity of the river of that name.* The islets of *Garcia* are on this parallel, at 2½ miles to the east of the point. The river is broad, but not very deep, and falls into the sea in a N.N.E. direction; the bay before its mouth affords anchorage in several depths; and at two leagues off there are 9 fathoms of water, over a bottom of fine sand. The shore is flat; the lands in the environs not very high, but distinguished by some remarkable hills, and at a few leagues in the interior stand the *Serras de Maratuba*, a chain of very high mountains.

At four leagues South from the Garcia Islets is another groupe, called the *Tamboretes*, at about two miles from the nearest shore. Five miles to the S.S.W. of the latter are the *Remedios Islets* and the *Lobos Tupilingo*, situate off the mouth of the *Aracary*, or southern branch of the Rio San Francisco. All these islets are covered with trees, and small vessels only pass between them and the shore.

From the Aracary to the Point *Itapacoroya* the low coast, in an extent of eight leagues, forms a slender bay, broken only by one small river, the Itapucu. In the southern part of this bay are the Itacolomi Rocks, 16 feet above water, and the *Feya*, of 32 feet. Here, also, is an armaçaõ. Near the islets you may anchor and obtain fresh water, sheltered from winds between the south and west.

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* The town of S. Francisco is on the North shore of the island, at 6 miles from the mouth of the river.

Between the Point Itapacoroya and the Island of Santa Catharina, or St. Catharine, the coast forms several bays, receptacles of the waters of five small rivers. In the last of these, to the N.W. of St. Catharine's, named *Tijoucas Bay*, there is good anchorage.

In September, 1831, H.M.S. *Volage*, on her passage to St. Catharine's struck soundings in 14 fathoms, bottom of mud, in latitude 26° 44′, and longitude (*corrected*) 48° 5′. From thence, while the ship was sailing two miles W. by S., bottom was found with 14 to 12½ fathoms; after which, on steering West and W.S.W. the water deepened suddenly to 23 and 29 fathoms; and these depths were preserved until the isle Arvoredo, at the north end of St. Catharine's Island, was passed. These soundings are represented on the chart. The variation here was found to be 7° East.

On approaching St. Catharine's, from the northward, several small isles and islets will be seen. The largest is that named *Arvoredo*, in latitude 27° 16′ 47″, long. 48° 20′. The channels between are perfectly safe; the depths varying from 22 to 11 fathoms, bottom of oaze and grey sand: taking care only to avoid the rock and breaker of San Pedro, which is situate at about 3000 toises or fathoms W.N.W. from Arvoredo. You may range along the points of land to the northwestward of these isles, named Zamba, Bombas, Garopas, and Camboriu, at the distance of 2 or 3 miles.

ISLAND of St. CATHARINE.—This island, which forms an excellent harbour, lies between the latitudes of 27° 22′ and 27° 50′ S. The harbour was visited and described by Captain Perouse in 1785, and by Admiral von Krusenstern, on his passage outward, in 1804. The island is nine leagues in length, and its greatest breadth is ten miles. The soil has been described as very fertile, producing rice, maize, mandioc, and coffee, oranges, and a variety of fruits, besides indigo and sugar. The lands have latterly been much improved: extensive tracts, formerly covered with large trees, have been cleared for ship-building; so that the quantity has been much reduced. Palm trees may be seen in every direction. Of birds there is great variety, and among the animals are opossums, monkeys, and armadillos, with snakes and serpents. The climate is, in general, serene and salutary, the tropical heat being moderated by the sea-breezes. The population exceeds 30,000. The island is divided into four districts, and the divisions on the opposite coast of the continent are under the jurisdiction of its governor, who is subject to the general government of Rio Janeiro.

Of the harbour Admiral Krusenstern has said, "Those going round Cape Horn, or destined for the whale-fishery upon this coast, cannot desire a better harbour than St. Catharine's to run into. It is infinitely preferable to Rio Janeiro, where strangers, particularly if they arrive in merchant-ships, are treated with the same insulting jealousy as in Japan.* Even Cook and Banks were exposed there to insults, the very relation of which cannot fail to excite disgust. In St. Catharine's, in the vicinity of which there are no diamond-mines, a stranger enjoys perfect liberty. The harbour is excellent, the water is very good and easy to be procured. Fire-wood may be felled free of expense; and, for what is really felled, and the vendor himself brings on board, a charge is made of ten piastres the thousand; every log of which is upward of three feet long. The climate is particularly healthy. Our people, after a residence of seven weeks here, were all perfectly well: during the first days, indeed, several of them were seized with a violent colic, which lasted only a few hours, and then disappeared entirely. The heat, even in January, the hottest summer month, is quite tolerable; and it is diminished by the constant fresh sea-breeze. Provisions and fruits, of all descriptions, are here both cheap and abundant. We purchased, for example, an ox, weighing 400lbs. for eight piastres; a hog, weighing 200lbs. for ten; and for five fowls we paid one piastre. The season was still too early for oranges and lemons, yet we had them, by thousands, for a mere trifle. Water-melons and pumpkins were in the greatest plenty. Of fish, indeed, we found a great scarcity; but the season, owing to the heat, was unfavourable for fishing, which is accounted a very profitable employment, excepting in the summer months. The only vessels used for this purpose are canoes, hollowed out of a single tree, of which some are more than thirty feet long, and only three feet wide: owing to this narrowness, though they run with great rapidity, they cannot venture to sea in rough weather.

"I shall conclude with some nautical and astronomical observations which we made here. The entrance is as easy as possible. The islands Gal and Arvoredo (at the entrance)

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* It is almost superfluous to say that this is no longer the case.—Ed.

trance) are not to be mistaken: the first, which is the smallest, and lies most to the northward, is particularly remarkable by its long white streaks on the steep side, as well as by two small rocks, which lie at the N.E. extremity. At the distance of about nine miles the depth is 30 fathoms, and gradually decreases. In coming from the northward, it is best to steer between the islands Gal and Arvoredo, leaving the small rocky islet S. Pedro on the right. The latter lies 3 miles W.N.W. of Arvoredo. The anchorage is perfectly safe everywhere, whether to the northward or southward of the fort Santa Cruz, which stands at the entrance; yet it is better to anchor to the southward, as well on account of communication with the town, as of the vicinity to the village of S. Miguel, where the best water is to be procured. In coming to St. Catharine's, from the southward, you steer between the island of Arvoredo and that of St. Catharine. The passage is perfectly safe. If the wind should be contrary, a ship may work in without danger; for, close to St. Catharine's, there are 4 fathoms of water, and the coast toward Arvoredo is equally deep.

"The observations on the tides were made on the Island of *Anhatomirim*, where the observatory was erected by Dr. Horner. The following are the remarks which he communicated to me on this subject.

"The ebb and flood are here very unsettled, and depend entirely on the wind. The flood sets in from the north, the ebb from the south; and, as the wind is almost always from the sea, the ebb, with a fresh northerly wind, is scarcely apparent, and seldom lasts more than two or three hours. The water continued sometimes at its height for three or four hours, together, during which no change whatever was perceptible, either in its increase or decrease. The lowest tide we had, was on the 27th of January, (1804), one day after the full moon, with a fresh north wind; and the highest tide, which rose three feet, was two days after the full moon, with a very moderate N.E. wind. A southerly wind kept the water up above an hour.

"The variation of the needle, which Frezier, in 1712, found to be 10° E., we found by a mean of two compasses, 7° 50′ E."*

The description of La Pérouse accords well with that of Admiral Krusenstern, and so does that of Captain Lisiansky. M. Pérouse, who visited the harbour in November, 1785, says, "The approach of ships to St. Catharine's is very easy. At eighteen leagues in the offing there are 66 fathoms of water, over a bottom of soft mud, gradually shoaling till within four cables' length of the shore, where there are still 4 fathoms of water."

The Baron Roussin says, that the Island of St. Catharine is sufficiently elevated to be seen in clear weather at the distance of 15 leagues. At this distance is found 62 fathoms of water, and this depth diminishes to four cables from the coast, where there are only 4 fathoms.

On approaching from the East the island appears in very irregular heights, being intersected by mountains separated by deep valleys; the greatest elevation is from North to South, and the mountains of the continent beyond it are a little more elevated than that of the island. You will particularly distinguish among them the *Morro de Camborella*, a branch of the eastern *Cordilheiras*, extending from St. Catharine's to Rio Janeiro.

About the middle of the isle, near the sea, is a large lagoon, under the high lands, which presents an apparent opening that may serve as a landfall. When, at 3 leagues from the eastern coast you bring this opening to the west, the N.E. point of the isle will bear about N.W. at three leagues.

All the exterior coast is clean and moderately steep, and you may range along it without danger, passing several large rocks which lie off it, as hereafter described.

The island may be navigated all round, and it presents numerous anchorages between its western coast and the continent, but the north part of the intervening channel is the part most fit for vessels drawing much water, and it is, therefore, that generally used. This passage is rather less than two leagues broad, is clear of danger, and on coming in you may advance to either side, only observing to keep clear of the *Northern Moleques*, large rocks which lie to the S.E. of Point Rapa, the north point of the island. This channel hence is clear, and you may beat up to either shore without risk, in from 40 to 28 feet of water.

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* From the Survey of the Isle and Strait of St. Catharine, made by Captain Barral, of the French navy, in 1831, it appears that the rise of tide is from 4 to 6 feet. High water at *2h. 15m.*

Having advanced within the Strait, you may anchor in any part according to the vessel's draught, and in keeping near mid-channel the depth will be sufficient for large ships when at 1000 toises (1065 fathoms) S. by E. from the little isle Anhatomirim, on which the fort of Santa Cruz is built. Passing this point, on advancing to the south-westward, the depth gradually decreases to 15 and 12 feet; and to the southward of the Raton Islets, lying on the eastern side, there is not more than 10 or 12 feet of water. In the large bay to the west, called the *Sacco Grande*, the depths are still less; this bay is a tranquil place, frequented mostly by vessels employed in the whale fishery off the coast, and is well adapted for small vessels.

The bottom is of mud, in almost all the anchorages of the gullet. From that which vessels of war mostly frequent, the following are the bearings by compass.

Point Rapa, the North point of St. Catharine's, N. 62¼ E.; middle of the fort of Santa Cruz, N. 56½ E.; Fort of St. José, near the N.W. point of St. Catharine's, N. 62½ E. and Point of the Armaçaõ on the continent, N. 9° 50′ E., allowing a variation of 7° E. The depth is about 5½ fathoms, and the bottom greenish mud, good holding ground. This place is generally smooth, being sheltered by the high lands around. The only open direction is N.W., but the winds from this direction are seldom strong.

There are several good watering places hereabout; the best is at two miles to the north of the isle Anhatomirim, on the continent, where plenty of excellent water may be obtained without expense, either by day or night, and permission may be obtained for cutting firewood, either on the continent or on one of the Raton Isles. You may also, at a moderate price, obtain building wood for repairs, should it be required. In short, the principal town of the island, and the habitations near the anchorage, supply, on reasonable terms, all the necessaries and refreshments produced in the country. These consist in cattle, pigs, fowls, rice, maize, arrack, farina of manioc, dried meat, sugar, coffee, tropical fruits, &c. The Isle of St. Catharine is, therefore, one of the best *relaches* or stopping places for refreshments for vessels engaged on long voyages, or requiring the same on a return.

The roadsteads of the island almost always abound in fish; but the success of the fishery depends on causes but little known; and all the seasons of the year, any more than all the hours of the day, are not equally favourable. La Pérouse found the fish abundant in the month of November, but Roussin was less fortunate in the same month, and in those of May and August. Most part of the beaches are besides strewed with the bones of whales, which are difficult to avoid when hauling the seine.

When you obtain wood from this country, and from the coasts of Brasil generally, it is best to prefer the young trees; the old trunks, commonly hollow, being mostly filled with insects and eggs of venomous reptiles, which might be injurious on board. It will be prudent to immerse the wood in the sea, before hoisting it on the deck.

The most common winds in the gullet follow the direction of the straight, either in one way or the other, but they are seldom violent, and the storms are not dangerous to vessels which are well moored. From March to September, which is the season here called the winter or southern monsoon, the winds in the vicinity of the isle blow generally from the South to S.W.; sometimes very strong, and accompanied with rain; but these violent crises do not exceed more than 48 hours.

Toward the month of October the winds approach the east and the north; the six following months constitute the summer, and are the hottest of the year. There are then frequent storms, which come from the North to the S.E. by the West; and when, in this season, the winds descend from the S.E. they are accompanied with considerable rain: but, in general, the greatest quantity of rain falls during the months of August and September; but even at this period some years have been exempted.

The tides are regular in the gullet, but it has been remarked that, as they enter by the North and South at the same time, meeting in the roadstead near the town, they return in a similar way, with greater or less velocity as they may be accelerated or retarded by the prevailing wind. The mean velocity of the current rarely exceeds three tenths of a mile in the hour at half tide, and the difference of level, in ordinary tides, is not more than three feet. In the Syzygies, however, the current frequently runs at the rate of a mile and a half, and then the water rises and falls 5 or 6 feet. Time of high water, on the full and change, 2*h*. 40*m*.

Should circumstances require you to seek the protection of the forts, this anchorage will not answer your purpose, and you must seek for that advantage either under the fort of Santa Cruz, on the Isle of Anhatomirim, that of St. José, on the Isle of St. Catharine, or the Fort Raton, on the largest of the two islets of that name: but the shot of these fortifications does not cross effectually from either point, at least with the artillery with which they are at present armed.

The governor of the province resides in the town of Nossa Senhora do Desterro, which is situate at about 10 miles S. by E. from the islet Anhatomirim, on the narrow of the strait, about half way down the island. This place, which is well sheltered, may be reached at all times by small vessels, and the communications between all the points are quickly made. At the anchorage, half a mile before the town, the depth, at low water, is 20 feet.

The approach to St. Catharine's may be made indifferently on the parallels between 27° 30′ and 28°. The winds and currents in the offing are not such as to cause much error in the route; but at all times you should prefer making the southern part of the isle in the southern monsoon, and that of the north on the contrary.

The Southern part of St. Catharine's and the coast to the southward were not surveyed by Captain Roussin, and, in consequence, M. Barral, commander of the gabare or surveying vessel *l'Emulation*, was charged with continuing the work, and surveying the Rio Plata. This mission was commenced in March, 1830, and ended in 1832; its result was two general charts, a number of particular plans, which have been finely engraved and since published, with a brief description, to which we owe the following particulars.

The description of St. Catharine's agrees with that of the Baron Roussin. The lands of the island and of the adjacent continent to Cape Santa Marta Grande are very high and woody. The highest mountains which are seen beyond the island are in the chain of *Cubatao;* they are covered with clouds during the prevalence of southerly winds, but are clear with winds from the N.E. In the offing, at 12 leagues from the island, there are soundings of 62 to 72 fathoms, with a muddy bottom. On approaching, the depth gradually decreases. At a distance of three leagues are 33 to 35 fathoms, and 18 to 28 at 4 miles.

The *Isle Arvoredo*, at the Northern entrance, which is high, has two sugar-loaf summits, which are first seen on approaching. The islet Badejo, 8 miles to the southward of Arvoredo, is destitute of vegetation.

A vessel drawing not more than 14 feet of water, and entering by the north passage for the town of N. S. do Desterro, having passed the north end of the island, should be guided by the following indications.

Steer for the Cape Quebra Cabaço, on the continent, leaving the two islets Ratones on the larboard side, at a mile and a half or less. The course toward the island of Anhatomirim will be about S.W. by W., and thence S.W. by S.

When you bring the Little or Southern Raton to bear E. ¼ N. [*East*] at two miles off, change the course to S.E. and continue it thus for 3 miles, passing a rocky flat, *Ipatitinga do Norte*, off Cape Quebra Cabaço, on the starboard side. On these rocks are only 4 or 5 feet at low water. When you have brought the Cape to the south of these rocks, bearing W.N.W., the route is to the S.W. until you bring the rocks N.N.W. ½ W.

You then steer to the southwestward, about half a league, so as to pass at 4 or 5 cables to the eastward of a rock near *Cape Henriques*, which, being a woody cape, is thus distinguished from Quebra Cabaço: next proceed southeastward, toward the narrow part of the strait, leaving the islet and point *do Lial*, on the western side, at the distance of 3 or 4 cables. Steering hence S. by E. you enter the Little Strait or Narrows, which is commanded on the left by *Fort Santa Anna*, and on the right by the battery of *San Joaõ*. Here you will find from 11 to 16 fathoms of water, and will perceive, in advancing, the islets *Gato* and *Das Vinhas*, at the extremities of the cove on which the town is built. You leave the first on the left, and may then cast anchor in 20 to 21 feet of water, with the islet Gato bearing N.N.E., Das Vinhas S.S.E., and the steeples of the cathedral N.E.

The city of N. S. do Desterro is situate in latitude 27° 35′ 25″, longitude (corrected) 48° 29′ 16″.

At times, on coming from the Northward to the town, there are found spots of only 7 feet of water, but the oaze has 5 feet of depth at least, and the vessel will not be injured. With high water the *Emulation*, which drew 14 feet, came up to the town in three days. When the water was low, and the stream weak, she anchored.

EASTERN COAST OF ST. CATHARINE'S.—All the eastern coast is clean, but off the points, at some distance, are several rocks and islets above water: these are, the Northern Moleques, the islet Badejo, before mentioned, the two Aranhas, the Isle Xavier, Ilha do Campexe, the Southern Moleques,* the Tres Irmaos or Three Brothers, the Papagaios Isles, the Fort Isle, at the entrance of the Southern Passage, and the Isle dos Cardos, within the same.

The Emulation proceeded along the coast at the distance of 3 or 4 miles, and passed between the Irmaōs and the Southern Moleques in 15 fathoms of water. The only obstructions are the islets and rocks abovementioned, which may be seen at three leagues off, and about which there are 13 fathoms. At the Isle do Campexe you may find anchorage, sheltered from southerly winds.

The SOUTHERN PASSAGE.—The Southern Entrance into the Strait or Gullet of St. Catharine's lies between the S.W. extremity of the Island, *Point des Naufragados*, and the Fort Isle, a very narrow passage, but in which there are 17 fathoms of water.

When you enter from the southward you should have a leading wind, rising tide, and fair weather, without which the current may carry you on the Fort Isle or on the opposite point, which are less than 300 fathoms apart. The vessel should not draw more than 15 feet. On coming from the southward you steer toward the Fort Isle, and when you have the Papagaios on your left, you will see the Irmaōs to the right. On passing hence northwestward the pass between the Fort Isle and Point Naufragados will be open. Having passed through, on a west course, you change the course to north, and pass the islet *Cardos*, which is remarkable for an insulated tree which stands on its summit.

You pass to the eastward of Cardos at the distance of one or two cables, and then proceed northwestward toward the *Enceado do Brito*, to the distance of half a mile; and thence north, along the western shore, to the point of *Pesqueiro Fondo*, at the distance of 4 cables. Thus you will leave, on the western side, the village of *Enceado do Brito*; and farther on a cluster of houses and cottages forming the little hamlet of Cedros. On your right, at a distance, you may see the village of *Ribeiraō* or *San Lapa*, on the Island of St. Catharine, and nearly before you will be an islet, the *Ilha do Largo*.

Before arriving at the last, you will have passed a flat of dangerous rocks, beyond which you will be when the steeples of the cathedral appear on the western part of the islet Largo, and the west point of Cardos is on the fort of the South Bar.

From off the Isle do Lorgo continue your course N. ½ W. until an islet, *des Cascas*, bears West; thence proceed toward the steeples of the city up to the anchorage between the islets do Gato and das Vinhas, which have been described.

THE COAST SOUTHWARD OF ST. CATHARINE'S.

Under Point Pinheira, which lies at the distance of 2½ miles from the south end of St. Catharine's, is a good anchorage, sheltered from southerly winds. At 2¼ miles from the outer extremity of this point is an islet, the *Ilha do Coral*, extending North and South; and, when seen in this direction it appears of a round form. It is covered with trees, is about three quarters of a mile in length, and is a useful mark for vessels bound in by the southern passage. Its situation is latitude 27° 55′ 10″, longitude 48° 29′ 10″. Between this islet and the Cape Sta. Marta Grande, in latitude 28° 39′, are other islets, which lie off shore as follow.

The Ilha das Araras, to the S.E. of Point Bituba, latitude 28° 18′ 0″, longitude 48° 31′ 32″.

The Islet Tocoromi, a high and steep rock, to the S.E. of the Ilha Arara, latitude 28° 19′ 29″, longitude 48° 30′ 30″.

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* The *Isle Xavier* is of moderate elevation and flat on the summit. The *Southern Moleques* are three great whitish rocks, touching each other, and forming what is otherwise called the *Grande Moleque*.

The Isle dos Lobos, de la Laguna, to the S.E. of the Araras and Tocoromi, latitude 28° 24′ 36″, longitude 48° 40′.

At Point Bituba begins the beach, within which is a lake and the towns of *Villa Nova Santa Anna* and *la Laguna.* The last has some trade with Rio Janeiro, and is situate at the south part of the lake, at a mile to the N.W. of the bar, in latitude 28° 28′ 33″ and longitude 48° 45′ 24″. At la Laguna is anchorage, practicable only for small vessels drawing under 7 or 8 feet of water, as there is a bar at the entrance.

The Cape Santa Marta Grande is the final termination of the line of mountains extending within shore to the northward, and is remarkable by having on its summit several great white rocks, which from a distance appear like an assemblage of houses. The variation of the compass here, in November 1831, was 7° 20′ E.

Between Cape Santa Marta Grande and the bar of the Rio Grande de San Pedro, an extent of about 95 leagues, the coast is extremely low, and variegated only by sandhills and stunted bushes. It can hardly be seen, in clear weather, from the masthead, at the distance of 7 or 8 miles, and from the deck at not more than three miles; the first part, from the north, trends nearly S.W. This part is called the Praya or Beach of *Torres:* it begins in longitude 48° 44′ 56″, and ends in 49° 55′ 52″. The second part trends N. by E. and S. by W., and is called the *Praya* or *Beach of Fernambuco.* Its eastern part begins with the termination of the former, in latitude 29° 52′, and it extends to longitude 50° 34′ 52″. The third part trends nearly S.W. and is known under the name of the *Praya do Destreito,* from latitude 31° 12′ to the mouth of the Rio Grande de San Pedro.

When to the southward of Cape Santa Marta Grande, you may see in running along, a chain of mountains extending westward about 15 leagues from the sea into the interior country, and disappearing at *Torres,* which stands at 25 leagues from the cape in latitude 29° 28′. The beach here may be approached to the distance of 3 or 4 miles, and was coasted at this distance by the *Emulation;* but there were no marks on shore fit for triangulation, and the situation of the vessel was ascertained by frequent observation and estimated distance from shore.

Twenty-seven fathoms of water, bottom of sand, mud, and shells, were found at four miles to the south of Cape Santa Marta Grande, and beyond that, in going to Torres, the water diminished to 4½ fathoms, near the shore. We may judge of the decrease of bottom in remarking, that from the 27 fathoms to the 4½, there is a distance of 25 leagues.

The *Praya do Fernambuco,* between the parallels of 30 and 31 degrees, is more steep than that of Torres. The *Emulation* found 35 fathoms of water, bottom of mud and sand, at 4 or 5 miles from the shore. On sailing out in the offing, to the distance of 15 leagues, the depths of water increase progressively to 85 fathoms, soft sand. Passing this limit there was no bottom at 100 brasses or 91 fathoms. At ten leagues out the depth is about 74 fathoms.

The *Praya do Destreito* terminates at the Rio Grande de San Pedro, as above-mentioned. From 9 to 13 fathoms were found in coasting along it, at 3 or 4 miles. At this distance the Emulation ran 17 leagues, over a bottom of sand. The shore is not higher than that of Fernambuco, but there are some sandhills more elevated, and there is more vegetation.

In the offing, at 20 or 24 leagues S.E. from this beach, are 34 and 35 fathoms of water, bottom of mud and sand, and on approaching land the depths gradually diminish.

We may remark that the beach of Fernambuco, the central beach of the three, has most water near the shore and in the offing; while, on the contrary, that of Destreito is that which has the least.

RIO GRANDE.—The district of the Rio Grande de St. Pedro is of great importance to the northern parts of Brasil; its port being the channel of communication with a rich interior, which supplies pulse, grain, and other productions. It includes the whole of the great lake called the *Lagoa dos Patos,* and of the rivers which fall into it, from the north and west. The Bar is represented in lat. 32° 9′, and long. 52° 4′. The entrance is shoal and difficult, and the Bar frequently shifts; but, after passing the latter, you enter into the *Lake,* and may then take a berth, or navigate as convenient.

The climate is so fine and the land so productive, that the country has been styled the Granary of Brasil. Wheat is exported hence to all the northern provinces. The population,

lation, taken within the circuit of 60 miles, has been computed at 100,000. The occupations of the inhabitants, an athletic and robust people, are mostly the rearing of cattle, drying and preparing hides, salting and drying beef, collecting tallow, horns, and horsehair. These staple commodities and productions give employment to more than 100 sail of coasters, some of which make two or three voyages in the year, importing rum, sugar, tobacco, cotton, rice, mandioc, sweetmeats, &c. Of European commodities they import wine, oil, olives, glass, iron, baize, coatings, stout woollen cloths, Manchester goods, printed cottons, calicoes, muslins, handkerchiefs; silk, cotton, and worsted hosiery; hats, flannels, &c.; sail-cloth, cordage, anchors, tar, paints, fowling pieces, and ammunition of all sorts; hardware, particularly slaughtering knives; plated ware, and fancy articles. The greatest part of these are conveyed into the interior on the backs of horses; but as of late the markets have been over-stocked, the trade is much reduced.

The neighbourhood of the town is unpleasant; the high winds so shift the sands that they penetrate into the very houses. The cattle in the neighbourhood are very numerous, as well as in the interior districts; but it is singular that neither butter nor cheese is made, nor is milk at all times to be obtained; and, although excellent grapes are produced, no wine of the country is obtainable. Mr. Luccock, on proceeding to this place, in 1809, has said,

"On approaching the coast of Rio Grande do Sul, we first made land in the neighbourbourhood of *Estreito*, about nine leagues north-east of the bar of the river whence the province takes its name. Little round hillocks of sand, without the slightest degree of vegetation, seemed to rise out of the water, to which a splendid sun communicated a dazzling whiteness. Soon it appeared that these were only inequalities of a sandy shore, from the midst of which arose the church of Estreito, a small building in the usual style of such edifices in the villages of Brasil. A few trees and a scanty portion of verdure about it now becoming visible, served to increase the forbidding appearance of the surrounding desert. Long before we saw any marks, by which to guide our course, we were in shoal water, and encompassed with sand-banks.

"The captain, having stationed himself at the mast-head, saw these shoals and the channels between them more clearly than they could be discerned from the deck, and gave us directions how to steer. At length a boat came out to meet us, with a pilot on board, and, by appropriate signals, did us the same service. These signals not only point out the course which a vessel is to take, but sometimes direct her to anchor where she is, or even to proceed again to sea when there is not water enough on the bar to carry her safely over. The first of these directions is given by holding from the boat a small flag in the direction which the vessel ought to take; the two latter by lowering it altogether. The signals are explained hereafter.

"When we had reached the boat she did not put the pilot on board, but proceeded a little a-head, sounding with a long pole, which was dexterously turned over from end to end, as we proceeded across a broad and shallow bar, situated in a deep and dangerous bight. We entered the river between a bluff head to our left, and a long low sandy point to the east, through a passage about half a mile wide, guarded by a few miserable erections called forts and batteries. Just within the passage lie the vessels which have received their lading, and are ready to proceed on their voyages, waiting for a sufficient depth of water on the bar. Round the point resides the *piloto-mor*, who has the superintendence of the place, and to whom I am greatly obliged for many kind and gentlemanly attentions.

"The decline of day, and tediousness of our progress, rendered me impatient, and induced me to ascend the mast, hoping to look beyond the flat, dreary, desolate, and almost houseless, waste, immediately before our eyes. From thence nothing was to be discovered, on the east, but loose and barren sand: westward appeared a tract of swamps, partially covered with brush-wood; beyond, a broad line of water, the Bay of Mangueira; and, still farther, the small white pretty-looking town of *St. Pedro do Sul*, commonly called *Rio Grande*. The church, which the people dignify with the name of cathedral, rose in the centre of the buildings, and formed the chief feature of the view. Before us lay several vessels at anchor, and among them a fine schooner with the British flag flying, indications of commerce which cheered our spirits, and gave us a more pleasant evening than we had enjoyed for a long time.

"Custom-house officers were put on board at the batteries; and the next morning the vessel was brought up to her anchorage in a masterly style, close to the village of St. Pedro do Norte, and three miles from the principal town; the sand-banks not permitting a nearer approach. From the entrance of the river to the anchorage, through a course of nine miles, the same obstructions prevail, leaving a narrow intricate channel, with barely water sufficient for a deep-laden brig. About six miles up, on the left hand, is a large bay still called the Bay of Mangueira, though little of that plant remains on the neighbouring swamps. In the bay, fishes of various sorts so abound, that afterward crossing it, at a late hour, great quantities threw themselves over our canoe, in every direction, and some fell into it. A little higher up is another broad inlet, navigable for yachts of fifty tons, within which is the fertile island of *Marinheiros*, containing some of the highest land, and the best cultivated spots, in the neighbourhood. The soil is a red clay, which shows that it was once attached to the continent, and is of older formation than the bay. It is celebrated for the production of onions, and of an article of higher value: from hence or from the island of S^ta^ Maria, the town is supplied with almost the only drinkable water used within it. Beyond these islands, the water expands to a breadth of more than ten miles, but is so very shallow, that the practicable channel which runs near the eastern shore, is in one part not more than 100 yards wide. Other islands, besides those which have been mentioned, are scattered about this expanse of water, and communicate to it some little ornament. The distance from the bar to the entrance of the Lagoa dos Patos is about thirty miles: the whole of which is, with some impropriety, called the Rio Grande, and considered as the harbour of St. Pedro. Through this long course, the channel is hardly any more than twelve feet deep, and, in some places, reduced to 6 inches; so that three feet may perhaps be nearly the average depth of the river.

"The country, as we advanced toward St. Pedro, and even in the environs of that town, was not much better than that portion already described. When settled, my favorite morning walk was to a fort upon the summit of the loftiest hillock near the place, from which, small as the elevation really is, there is a spacious view of the river, and of a region wild and desolate in almost every quarter. To the north lies the fine island of Marinheiros; to the south a marshy tract, partially covered with vegetation, the ground rising and becoming drier as it approaches the ocean: to the east, beyond the water, are loose sand hills, their height from 120 to 140 feet; the tops are usually round; toward the west, the country is also sandy, gently undulated, and destitute of every thing green. When the wind blows strongly from the S.E., as it often does, it brings with it so much sand, which whirls from the tops of the hills like smoke from a volcano, that the eyes can hardly venture to take that direction. Turning the back to the wind for relief, the sand is seen travelling onward like a vast fall of snow; a portion of which, impeded by the town, is piled against the houses, and sometimes mounts and crushes the roofs. The extent of this desert, however, is not great; it forms a slip along the edge of the ocean, not more than fifteen miles broad at a medium, though it is 300 miles long; and here and there are scattered rich oases, the sites of pleasant farms. The sand evidently comes from the ocean, being first cast upon the coast, and then driven farther inland.

"The town of St. Pedro, situated in a level plain, not many inches above high-water mark, contains about 500 dwellings; and the whole number of stationary inhabitants may, perhaps, be 2000; two-thirds of which are supposed to be white, or very slightly tinged. But some of the houses, belonging to persons who reside on their estates, are seldom occupied, except at religious festivals.

"There were here marks of vigour, precaution, and discipline, such as I had not before seen in this part of the country. On the northern side of the Plata, not a single sentinel made his appearance, and the soldiers were ill clothed, and worse accoutred. But at Rio Grande, men under arms, properly furnished for their duty, were stationed at the government-house, on the quay, and at all public offices.

"The neighbourhood of the town afforded a sphere for the consumption of some of its imports; more of them proceeded up the Lagoa dos Patos, to Porto Alegro, and the rivers which fall into it; up the Lake Mirim, and through the Ygaroon to the fine country lying at the back of Monte Video and Maldonado. From these extensive waters the exports are collected, consisting chiefly of hides, tallow, wheat, onions, cheese, and charqued or jerked beef: all these articles are sent to Rio Janeiro, only that Bahia shares with it the last mentioned. The vessels sailing from Rio Grande, in 1808, amounted to 150, half of them to Rio Janeiro; they were, in general, brigs from 100 to 200 tons burden, and completed their voyages in four or five months. The country produce is brought down in yachts, of from 20 to 70 tons burthen. A few of the brigs load at Porto-Alegro; the greater part at St. Pedro, whence all are obliged to take their clearance. The value of this trade to Brasil is incalculable, notwithstanding the injury which it receives from the government's draining the country of its cash, and furnishing nothing in return."

SAILING DIRECTIONS.—1st. *by Captain Wm. Grant*, in 1802.—Finding yourself in latitude 31° 30′ S., and having N.E., E.N.E., or Easterly winds, (any other winds may be dangerous, that is from the sea,) you may stand with security for the land, steering W.S W., until you find yourself in soundings; and when you find yourself in 13 fathoms, you will see the land, if to the northward of the bar; but, if you have passed it, you will not, as the bank to the southward stretches out to a greater distance; and you cannot see the land unless when you are in 8 fathoms, and then barely.

The land, about 31° 40′, you will know by seeing several tufts of trees, pretty high and rounding to the northward; and, standing alongshore, steering S.W., you will see sundry straggling-tufts, but not so high. Here, if it be very clear weather, you may see houses, which will appear in the opening of the trees. You may then stand alongshore with safety, keeping in from 10 to 9 or 8 fathoms. Losing sight of the trees and houses, you will see some mountains of sand and an entire sandy beach; and, when you are within two leagues of the bar, you will see tufts of trees, and find the soundings decrease, with a bottom of mud and red shells. You must now keep in 8 fathoms, but not less, as the water sets right on shore when close to the beach. The lead must now be kept going until you find soft mud, when you will find yourself close to the bar, which may be known by seeing several stakes along the beach: you must then haul up and steer south, to keep clear of the bank. You may easily know the bank by the sea's breaking over it, particularly from the eastward.

2nd. Directions, by *Captain James Harrison*, of the brig *General Wolfe*, which first appeared in the Nautical Magazine, October, 1836.

No vessel should attempt to enter, if drawing more than 10½ or 11 feet of water, and she must have a leading wind, in order to cross the Bar.

"The land ought to be made to the N.E. of the Bar, in about latitude 32° S. There is no difficulty in doing this, as the soundings are perfectly regular, about 60 fathoms at 60 miles' distance, and shoaling very gradually. When in 10 or 11 fathoms you will see the land. It is not advisable to get inshore to the southward of the Bar.

"The coast is little known; and I could never get any of the coasters or pilots to give me any information about the shoals said to exist thereabout. In general, but not always, the bottom is mud to the southward, and abreast of the bar, whilst it is usually sand to the northward; and if to the southward of the port, the land will not be seen till you are in 7 or 8 fathoms. I do not know of any marks to tell how far you are from the port, as the whole shore consists of low sand-hills, interspersed with bushes, and these hills alter their shapes with every gale of wind. The town of *Estreito* lies about 30 miles N.E. of the Bar, but you must be close inshore to see it. This is the only object which breaks the sameness in the appearance of the coast for many miles. The latitude is the best guide.

"After making the land, run down at a convenient distance, till you see a square white tower, which stands at the entrance of the harbour, in latitude 32° 9′ S.* This is a very conspicuous object; makes like a sail at a distance, and may be seen some time before the land about it. On the top of this tower, (which shows a bad light at night,) a man is stationed, who, as soon as he perceives a vessel, hoists a red flag, when the pilot-boat goes out to sound the bar. So soon as you see the tower distinctly, hoist the signal corresponding to your draught of water at the fore, as presently explained. When you get down to within three or four miles of the tower, haul inshore into 4½ fathoms, if a commanding breeze, or you may bring the tower to bear W.N.W. ½ W., and steer for it; when you will soon see the boat at anchor on the bar, with the signal corresponding to the depth of water on the bar, flying at her masthead.

"Should there not be sufficient water for you, the red flag on the tower will now be hauled down, when you must haul out to sea, and cruise off and on till the water rises. Sometimes a vessel gets down near the bar before the boat gets out. In this case the red flag will be hauled down, and you must keep off and on till she arrives at her station: you will probably see her beating out, but do not attempt to run for her until the red flag is up again. Do not lie to, as there is usually a strong lee current. The boat not being out in time seldom happens now, as the pilots are much more attentive than they used to be. So soon as the flag is up again, steer for the boat.

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* M. Barral gives it as only 32° 7′ 20″.—Ed.

"Particular attention must now be paid to a man in this boat, who will wave a small red flag on the end of a long pole, in the direction you are to steer. Thus, if he wants you to steer more inshore, he will point toward the shore, and keep it pointed in that direction till your course is altered sufficiently, when he will lower it; and vice versa. Luff to, or bear away immediately, according to the signals he makes. When you get near the boat, he will weigh his anchor, and proceed ahead of you. Follow in his wake, still paying attention to his signals, and you will soon pass a second boat at anchor: here the water deepens, but the channel is not a cable's length broad. After passing this boat, you haul more up toward the guard schooner, and choose your anchorage any where to the westward of and near her, (till you are out of quarantine,) in from 4 to 8 fathoms, excellent holding ground. Do not go to the eastward of her, as she lies on the edge of the bank. Have an anchor ready the moment you are over the bar, as it frequently falls little wind when you open the river, with a strong current setting out over the banks.

"The bar has been moving gradually for some years past from the S.W. to N.E. It has moved about a quarter of a mile to the N.N.E. since I have known it; that is to say, in about two years.

"There are no regular tides in the Rio Grande; the current commonly runs with the wind; and, as in the River Plata, and I believe all along this coast, S.W. winds raise the water, and northeasters depress it; consequently a vessel may load in the port to 12 feet, as there is almost always plenty of water with the S.W. wind, which blows right over the bar.

"The S.W. storms, called *Pamperos* by the Buenos-ayreans, and *Rebojos* by the Brasilians, blow furiously here in winter, about the full and change. They usually come on in a sudden gust, though the appearance of the sky gives sufficient warning for some time first, and blow very hard indeed for five or six hours, when the wind decreases, and a few days of very fine weather succeed. Sometimes they draw round to the South and S.E. before the wind abates, which renders it highly dangerous for a vessel near the coast. As the water is shoal, there is a deep ground swell, which sets a ship very fast inshore. It may be as well to observe that, in consequence of the disturbances in the province, the red flag was hoisted in April last at the guard-ship's masthead, instead of on the tower, and was so when I came away in June last, [1836,] as a party of the revolutionists had gone there, plundered the pilots' houses, and pulled the flagstaff down, but without further injury to the tower. It is to be supposed that this state of affairs will not last long. The flag is not quite so well seen at the guardship's masthead, and the look-out man cannot see a vessel quite so far off as before: this makes the only difference. The signals are made in palms, each palm being nine inches. I am aware that the proper Portuguese palm is somewhat less; but nine inches is always the calculation made here for the draught of water."

The signals to be hoisted at the fore-top gallant masthead, on making the tower of Rio Grande de San Pedro, in 1836, were as follow:

A white pendant signifies 7 palms, or 5 feet 3 inches English.
A blue pendant, 8 palms, or 6 feet.
A red pendant, 9 palms, or 6 feet 9 inches.
A white flag, 10 palms, or 7 feet 6 inches.
A blue flag, 10½ palms, or 7 feet 10½ inches.
A red flag, 11 palms, or 8 feet 3 inches.
A white flag over a blue flag, 11½ palms, or 8 feet 7½ inches.
A blue flag over a white flag, 12 palms, or 9 feet.
A white flag over a red flag, 12½ palms, or 9 feet 4½ inches.
A red flag over a white flag, 13 palms, or 9 feet 9 inches.
A blue flag over a red flag, 13½ palms, or 10 feet 1½ inches.
A red flag over a blue flag, 14 palms, or 10 feet 6 inches.
A blue pendant over a white flag, 14½ palms, or 10 feet 10½ inches.
A white flag over a blue pendant, 15 palms, or 11 feet 3 inches.
A blue pendant over a blue flag, 15½ palms, or 11 feet 7½ inches.
A blue flag over a blue pendant, 16 palms, or 12 feet.
A blue pendant over a red flag, 16½ palms, or 13 feet 4½ inches.
A red flag over a blue pendant, 17 palms, or 12 feet 9 inches.

On the WINDS, TIDES, and CURRENTS, between the *Island of St. Catherine* and the *Rio Grande de San Pedro:* by M. Barral.

At the Island of St. Catharine the prevalent winds are N.E., N.W., S.W., and S.E. The N.W. winds bring fine weather; and, in the winter, the S.E. are extremely rainy.

The tides in the strait or gullet have been already noticed. The sea rises in the southern basin from the South to North, and in the northern basin from North to South; so that the streams meet and accumulate near the town, in the narrowest part of the strait; and they run out in the contrary direction.

On the beaches of the Rio Grande de S. Pedro the winds from S.W., N.E., N.W., and S.E., are equally the most common; but those from the S.E. are most violent and dangerous. A vessel, surprised by a gale in this direction, on the coast, must bear away. In a gale from E.S.E. the *Emulation* was carried toward the beach of Torres, for several hours, and the sea, with 27 fathoms of water, every where broken, ran so high as to endanger the masts. During S.E. winds the sea is always heavy, and the current along shore runs with great rapidity. The winds commonly veer to the S.E. after having blown from the S.W.; and again changing are succeeded by N.E. winds, or variable, between N.W. and W.N.W.

St. PEDRO TO THE RIVER PLATA.—From the Bar of St. Pedro to *Cape Santa Maria* or St. Mary, at the entrance of the River Plata, the distance is 60 leagues. The coast between is generally low and flat, having within it numerous lakes and ponds. In the parallel of 34° 20′, are the remarkable rocks called the *Castelhos* or *Castillos Grandes*, 9 leagues to the north of which are the *Castelhos Chicos*. Mr. Luccock says, "The rocks called Great Castelhos consist chiefly of three large masses of naked granite, about a hundred feet high from the water, with perpendicular sides and roundish tops. They appear close to the shore, and, at a distance, are thought to resemble castles built on the beach; but, if there be such a resemblance, at any point of view, it vanishes on a nearer approach. They are backed by low woody hills; and the beach to the northward of them, as far as the Castelhos Chicos, is flat and sandy. There seems an expanse of water toward the west, which ought to be surveyed, as probably a harbour might be found, useful for small vessels, when the wind blows hard from the south-east. More than once I have known these rocks mistaken for Cape St. Mary; the cape, however, is very different, being a flat sandy point. The coast between them is low and naked, with inlets, some of which are said to afford good anchorage.

"Near to the little Castelhos is the Fort of Santa Teresa, whence the road (inland) to Maldonado is very delightful."

From the Castelhos Grandes to Cape St. Mary, the distance is seven leagues. The cape, which is low, is described hereafter. From Cape St. Mary to the east point of Maldonado, the bearing and distance are S.W. ¾ W. [*nearly W.S.W.*] 14 leagues.

VIII.—RIO DE LA PLATA.—POSITIONS, &c.

	Latitude S.			Longitude W.		
	°	′	″	°	′	″
CAPE STA. MARIA OR ROCHA	34	39	1	54	4	54
Isle of Lobos; centre	35	0	51	54	48	57
TOWN of MALDONADO: the tower	34	53	27	54	54	22
Isle Gorriti; English tomb	34	55	43	54	55	11
Ballena or Whale Point	34	53	44	54	59	17
Punta Negra, or Black Point	34	53	1	55	12	17
—— d'Afilar	34	47	15	55	26	17
—— das Piedras Negras de Sta. Rosa	34	46	30	55	39	3
Isle of Flores; Light-tower on S.W. end	34	56	19	55	51	42
MONTE-VIDEO; the Cathedral	34	54	8	56	8	19
Isle Ratos de Monte-Video	34	52	3	56	10	4
Hill and Lighthouse of Monte-Video	34	53	2	56	11	39
Point Espinilla	34	49	50	56	21	4

The

	Latitude S. ° ′ ″	Longitude W. ° ′ ″
The Panela Reef	34 54 45	56 21 9
Punta del Saucé	34 25 21	57 21 30
Colonia del Sacramento	34 28 14	57 45 46

SOUTH SIDE OF THE PLATA.

	Latitude S. ° ′ ″	Longitude W. ° ′ ″
CAPE SAN ANTONIO	36 19 36	56 42 24
Rio Salado; Entrance	35 44 1	57 19 24
Hillock of Juan Jeronimo	35 29 15	57 15 39
Point Piedras of San Borombon	35 27 40	57 4 9
Hillock Salvador Grande	35 19 10	57 4 55
Point del Indio or Indian Point	35 15 20	57 6 51
First Ombu tree of the Magdalena	35 2 45	57 25 21
Magdalena; the church	35 2 14	57 28 51
Atalaya Point	34 54 56	57 39 17
Punta de San Jago	34 50 16	57 50 14
———— Lara	34 47 14	57 56 34
BUENOS AYRES; Mandeville House	34 36 18	58 19 6

MALDONADO.—On the western side of the Bay of Maldonado, at two-thirds of a mile from the eastern shore, is a small low island, named *Gorriti*, and having a few buildings upon it: under its lee is the harbour, the beach of which is exposed to a heavy surf, which renders landing sometimes dangerous, at others impossible. This island forms two entrances, but that on the eastern side of it is very narrow. On the west, the coast is bold and stony. the entrance two miles broad, and to small vessels safe; but, about mid-way, is a rock with twenty-four feet of water upon it, on which the English ship of war, *Bedford*, once touched and laid a buoy. The anchoring-ground is near the centre of the bay, and here lies the wreck of a British ship, the Agamemnon. *A more particular description is given hereafter.*

The town of MALDONADO, which from the sea, has no very attractive appearance, is two miles from the shore, standing on the brow of a hill gently descending 250 feet above the level of the water. The principal buildings form a quadrangle, and include a fine new church. The common habitations are built of brick, and covered with straw. The houses in the streets, issuing from the square, are chiefly low, and constructed of earth. The whole number is about 250; that of the inhabitants about 1000.

The best landing is in a cove, under the S.E. point. Fresh beef and vegetables good and plentiful. Abundance of fish may be caught: but fuel is scarce in all the river of La Plata.—1824.

Of Maldonado the Hon. Captain Bouverie has said, "The Spanish surveys of this bay lay down a sufficient depth of water for any ship between every part of the island and the main; however, it cannot be safely entered, but by small vessels, except to the westward: and you must not go farther in than to bring the N.W. point of Gorriti to bear S.S.W. ½ W., or S.W. by S. by compass, with 4½ or 5 fathoms, good strong clay. With southerly winds there is, in the east passage, a heavy swell; and the water, from the ground being uneven, breaks almost the whole way across in bad weather. The *Diomede* (fifty-gun ship) passed through it to the anchorage before its dangers were known, and had not less than eighteen feet; but there are places where there is so little as 1½ fathom; and it is very irregular. There is a bed of rocks to the south of Gorriti; the marks for it are, the Tower of Maldonado, North, and the outer part of Point del Este, E.N.E. ½ E.

"In the direct line of the entrance of the bay, from the westward, is a bed of rocks, where there are parts having only 3 and quarter-less 3 fathoms. The bearings, taken on the rocks, are, N.E. point of Gorriti E. ½ S.; N.W. point of ditto, E. by S. ½ S.; S.W. point of ditto, S.E. by S.; Point Ballena, W. by N. ½ N.; the hill of Pan de Azucar, just within the extremity of Point Ballena. In mid-channel, between these rocks and the island, are 6½ and 7 fathoms; their distance from the island is about three quarters of a mile. There are 7 fathoms close to them, all round the western side.

"The *Watering-Place* is on the main, close by a battery: the stream loses itself in the sand, except when swollen by heavy rains, and you have to roll your casks about sixty yards over the sand: the water is very good."

LANDFALLS, *or* Points *of* Recognisance, *on approaching the* Plata, *as described by* Captain Barral.

These are three; the *Cape Santa Maria*, the isle *Lobos*, and *Cape San Antonio*.

Of Cape Sta. Maria the position, determined on land, has been found to be latitude 34° 39′ 1″, longitude 54° 5′ nearly. The variation of the needle, Feb. 1831, 11° 7′ E.

Although of very moderate elevation, this cape may be known by the vicinity of two islets, named *Tuna* and *Paloma*, which are separated from each other by a space of 43 fathoms in extent, and which forms a passage for small vessels, drawing less than 10 feet of water; this is the entrance to a cove, sheltered by the cape and the two islets, wherein 7 or 8 vessels may lie in 11 or 12 feet.

The islet *Tuna*, the smallest and nearest to the cape, is covered with the cactus or prickly pear. On coming from the offing, in this direction, there will be seen an extensive sand-down, steep-to, followed by a very low beach. To the north, on a hill, is seen a group of houses, composing an *Estancia*, or establishment for the rearing of cattle. Near these houses are some trees, and around are several inclosures.

The coast to the north forms a large bay, of 14 miles in extent, with a point encircled by the islets Palmarones and Castillos. The islet Palmarones, near the point, is verdant; the Castillos arid and barren. The resemblance of the point to that of Cape Sta. Maria has caused several wrecks. From this reason the bay has been called *False Bay*.

At two miles to the East of Castillos are 14 fathoms of water, bottom of sand. From the islets of Cape Sta. Maria, at the same distance, are 10 fathoms, with sand, or sand and gravel. To the south, at three miles, 18 fathoms, sand; and to the S.W. 16 to 20 fathoms, bottom of oaze.*

Lobos or Seal Island is situate in lat. 35° 0′ 51″, and long. 54° 49′ 22″. It is not a mile in extent, but may be seen 15 or 16 miles off. It is destitute of vegetation, but is the resort of a great number of seals; whence its name. The eastern part must be avoided, because a chain of reefs extend three miles from it, into the offing. Large ships pass safely through the channel between the isle and main, in 15 and 16 fathoms of water.

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* More than twenty years ago Cape Sta. Maria was described as follows by the Honorable *Captain Bouverie*, of the British navy.

"Cape St. Mary is a low point, with rocks all about it. The direction of the coast, to the westward of this Cape, becomes more westerly than at any other part northward of it. At about six miles north of it is a house, with a row of trees northward of the house, (probably a fence of high prickly-pear bushes,) which is very remarkable.

"About a mile south of the house is a bluff point, with a few rocks at the foot, which is remarkable, being different from the rest of the coast, the general character of which is a sandy beach. One cannot fail knowing the Cape by these marks, running down the coast near it. If you are at any distance off, you will not perceive them. The water off Cape St. Mary is shoaler than to the northward. To the north-eastward of the Cape, between it and the islet Paloma, you have 10 or 11 fathoms at a little distance from the shore.

"Ships, in general, make the land with N. or N.E. winds; therefore it is best to keep in the latitude of the Cape, or a little to the northward of it, till you get soundings, as the current sets to the S.W. It is better not to make the land north of the Cape: not that I believe there is any absolute danger; but the water in many places is shoal a long way off the land, and would alarm any one not acquainted with that circumstance.

"In latitude 33° 27′ S. and longitude 52° 9′ W. [52° 16′?] is a shoal, where we found 9 fathoms of water. I believe it is a ridge running in that parallel of latitude all the way to the shore. In latitude 34° S. is tolerably high land, on which is a fortress, called *Fort Teresa*. It is a square with bastions at the angles. It has three guns in the face and one in the flank, and stands about a mile from the beach. About six leagues N.N.E. from it is a mark, set up, as the termination of the Spanish [*Argentine*] territories.

"*Being in the latitude of Cape St. Mary*, and having got ground in 28 or 30 fathoms of water, fine sand and shells, you may reckon yourself twenty leagues off shore: with from 15 to 20 fathoms, sand and clay mixed, you are not far off the land. When you have not seen the land before night, be sure to keep to the northward of the Cape by your reckoning, to allow for the current, which sets to the southward. This is the case with the above-mentioned North and N.E. winds. With South and S.W. winds the current runs strongly the other way.

"I am inclined to think that the *strong north-easterly currents*, which are to be met with off the mouth of the Plata, when the wind is about to blow, or blowing, from the south-westward, do not extend much, if at all, beyond the bank of soundings."

Cape San Antonio.—Under this name we comprehend a line of hillocks, composed of sand, extending to the East and the South, and terminating on the West by a very low coast, covered with shrubs or small trees. The position, determined from the anchorage, is given as latitude 36° 19′ 36″, longitude 56° 42′ 22″. Variation of the needle, Dec. 1831, 13° 30′ E. The point determined is at the division between the sand hills and verdant shore. The cape is surrounded by a sand-bank, which frequently breaks at a considerable distance from shore; it extends to the north and east, and should not be approached without caution.

DESCRIPTION.—The MOUTH of the RIO DE LA PLATA, between the East point of Maldonado, on the North, to Cape St. Antonio, on the south, is 42 leagues in breadth. The bearing from one to the other is S.W. ¼ S. [*S.W. ¾ W.*] An extensive bank with several shoals upon it, occupies the greater portion of this space; but there is a channel both to the northward and southward of the bank, of which that to the northward, about 5 leagues broad, in its narrowest part, is the chief.

The narrow rocky islet, LOBOS, mentioned above, with a cluster of rocks extending from it to the eastward, lies at the distance of 5 miles S.E. ½ E. [*S.E. ½ S.*] from the eastern point of Maldonado, in latitude 35° 1′. At 18 leagues W. ¾ S. [*W. ½ N.*] from Lobos, is another small isle, FLORES, in latitude 34° 56′ 20″, now rendered conspicuous by a lighthouse:* and, at 16 miles beyond or westward of Flores is the port of MONTE VIDEO, on the western side of which, upon the summit of the mount, is another lighthouse, elevated 478 feet above the sea, as shown hereafter.

On a S.W. line from Monte Video the river contracts its breadth to that of 56 miles, where *Ponta de Piedras* or *Rocky Point*, presents its face to the East. At four leagues higher, in lat. 35° 16′, long. 57° 6′, is *Point Indio*, distinguished by trees; and, at about 22 miles above, or to the northwestward of this, is the village of *Magdalena*, with several *Estancias* or cattle farms. Ten miles above Magdalena is the *Atalaya* church; and, at 4½ leagues higher is *Point S. Iago* and the *Ensenada*, or Careening Place, of *Barragan*, which are 9 leagues below *Buenos Ayres*.

On all the coast between Point Piedras and Point S. Iago the water is shoal to a considerable distance from shore, with 3 to 2 fathoms, hard ground.

Extensive Banks, called the ORTIZ (or *Orthes*) and CHICO, occupy a great portion of the central part of the river, northwestward of Point Piedras, and they form three channels, of which the deepest is the middle one, between the Ortiz and Chico. The general depths in this are from 3½ to 4, 5, and sometimes to 6, fathoms. In the southern channel, between the Chico and shore, the depths are 3½ and 3 fathoms; and in the Northern, there are only 3 and 2½ fathoms. The channels between these banks and the navigation up the river, to Buenos-Ayres, &c. are copiously and fully described in the New Sailing Directory, so frequently mentioned in this work.

Three towns of the republic of Uruguay, stand on the north side of the river; the first, in coming from Cape Santa Maria, is *Maldonado*, already described, the second *Montevideo*, and the third *Colonia del Sacramento*. The chief or capital is the city of *S. Felipe* or *Monte-video*.

Buenos-ayres, the only town on the south side of the river, is the capital of the United Provinces of *La Plata*. Its distance from the River Paraña is five leagues. From Cape Sta. Maria to Maldonado the distance is 16 leagues; from Maldonado to Monte-video, 21 leagues; and from the last to Colonia, 31 leagues. From Cape S. Antonio to Buenos-ayres the distance is 45 leagues.

Near the North shore are several isles and a number of rocks both above and under water. These isles are, *Lobos*, 8 miles to the southeastward of Maldonado; *Gorriti*, in the Bay of Maldonado: *Flores*, having the lighthouse, already noticed, 15 miles to the eastward of Monte-video; the islets of *San Gabriel*, *Farallon*, and *Lopez*, before Colonia, and those of *Hornos*, at a league and a half to the N.W. from that town. The rocks are all within a short distance from land.

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* The Light-tower on Flores was first lighted on the 1st of October, 1826, and it exhibits a brilliant light, with revolving eclipsers. It stands on the highest S.W. part of the isle, whereof the height above the level of the sea is 63 palms, or 45 feet. The height of the Lantern is 75 Palms, or 54 feet. So that the total height is 138 palms, or 99 English feet.

At the entrance of the river and at Monte-video, the most prevalent winds are the N.E. and the S.W. At Buenos-ayres and at La Colonia the prevailing winds are from North, N.W., S.E., and S.W.

During summer, when the weather is fine, the winds blow over all the river, pretty regularly, from the East to S.E., after six in the morning to sun-set. In the night the winds vary to the north.

S.W. and S.S.W. winds are known in the Plata under the denomination of *Pamperos*, as coming from the Pampas or Plains, over which they pass.* They clear the sky, and commonly blow after rain, or when the wind has varied from the North to N.W., and to West; and, in the summer, after a calm and very hot day. Sometimes the Pampero comes on after a strong N.E. wind, while the sun is obscured by clouds, when its gust is sudden and very dangerous. It thus meets the ships which are found in the Plata or near the entrance, and is indicated by a sudden fall in the barometer, which rises afterward.

As it rains more frequently in the winter than in the summer, this wind is more common in the rough season, and then lasts for two or three days. In summer it blows stronger, but generally ceases sooner. It is then designated in the country *Turbonada*, equivalent to the French word *Tourmente*, and to the English *Storm*.

When the weather is fine, with the wind light and constant, the tides are regular on the shores; but when there is any perturbation in the direction and force of the winds, the tides become irregular, and form currents, which frequently acquire a velocity of 4 and 5 miles an hour.

At *Buenos-ayres* the sea is high with winds from S.E., and low with winds from N.W. and S.W. At Monte-video and on the rest of the north shore the waters rise with S.E. and S.W. winds, and fall with northerly ones. The differences of level on the two shores, rarely exceeds four or five feet; but in strong N.W. gales the rise is, at times, 10 feet.

In the months of March, April, and a part of May, the river is higher than in the other months of the year, being raised by the increase of the waters of the Paraña and Uruguay, which bring down, at that time, trees and bushes from the verdant islets of the river. This is the finest season of this part of South-America, with the winds moderate and temperature agreeable. During the spring, summer, and winter, the winds are almost constantly strong and the temperature of the air very variable.

ANCHORAGES.—Wherever the lead indicates oaze or muddy ground you may drop an anchor, only taking care to be at a sufficient distance from the bank, and so as not to drive upward.

With the winds in the southern quarter the anchorages on the south side are the best; but with northerly winds the opposite side is to be preferred.

Ships of war and large frigates may ascend to Monte-video; all ships drawing 16 or 17 feet of water, may safely proceed to Buenos-ayres on the one side, and to the Hornos Islets on the other.

The anchorages sheltered from N.W., N.E., East, and S.E. winds are Maldonado, Monte-video, and Hornos. Those sheltered from the S.W. are the Ensenada de Barragan and Buenos-ayres.

Small ships may also anchor at the entrance of the River of Santa Lucia, and at Colonia on the north coast, at the Rio Salado in the Ensenada de San Borombon, and at Riachuelo near Buenos-ayres on the south side.

You may anchor at Maldonado in 6 or 7 fathoms of water; at Monte-video, in the Road, in 5 fathoms; in the harbour in 3 or 3½; at the Isles Hornos in 3½ or 4 fathoms; in the road of the Ensenada de S. Borombon in 4 fathoms; near Buenos-ayres, in the road, in 3½ or 4 fathoms; and near the town in 2 and 2½ fathoms.

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* See the description of the Pamperos, page 6, and the Remarks of Captain Beechey at the conclusion of this section.

In the anchorages of the north coast you ought to moor during S.W. winds, and in the others with the winds southeasterly.

Of all the ports and roads the best holding ground is at Maldonado; this is oaze covered with sand. Elsewhere the bottom is of soft mud, on which the anchors drag in gales of wind. During the Pamperos the Isles de Hornos present very good anchorage, the sea before them being broken by the Bank of Palmas.

Depths of the River at the Entrance, and in the Offing.

When you have gained the parallel of Cape Santa Maria and longitude 51° 54′, the depth, at the distance of 33 leagues from the cape, is 80 fathoms, bottom of oaze; at 25 leagues the bottom is of sand, or of oaze mixed with shells, and the depths only 35 to 25 fathoms. On advancing nearer to the cape the decrease in depth is irregular.

On the parallel of Castillos, 34° 24½′, at 33 leagues off, the depth of water is 52 fathoms, and the predominating quality of the bottom is of sand.

In navigating on the parallel more to the south, or that of Cape Santa Maria, less water will be found in the same longitude, and the depths gradually diminish.

At 15 leagues from Cape St. Antonio is a depth of 15 fathoms, sand: at 28 leagues from the same cape, to the S.E., are 40 fathoms, similar bottom. To the north of the cape, at 5 leagues from land, are 6 and 7 fathoms: and in the direction of the English Bank, on the parallel of 35° 11′, are 5 and 6 fathoms, with sandy bottom; at five leagues without the same, near the meridian of 55° 35′.

When turning in, on the parallel of 35° 20′, and having attained the same meridian, the bottom has been found of fine sand, the lead indicating about 7 fathoms of water. On the parallel of 35° 35′, and thence to Cape S. Antonio, the bottom is of sand, mixed with shells or gravel.

From the latitude of 35° 20′, having passed the meridian of the English Bank, the depth does not increase to more than 7 fathoms. On the parallel of 36° it attains 10 and 11 fathoms. To the west of the bank, on this parallel, are 5 and 5½ fathoms only.

At twenty leagues off, from the entrance of the Rio de la Plata, the water loses its blue colour, and assumes that of green tinged with yellow.

On running for the north shore, when in view of or near the land, the quality of the bottom will be oaze. When running on a parallel a little higher than that of the isle Lobos, on the north of this isle, oaze will also be found; at two miles south of it are 14 and 14½ fathoms of water; and, at 6 miles, 20 and 21 fathoms. From Lobos westward, toward Monte-video, the depths of water diminish gradually, but irregularly.

In the passes, formed by the banks of hard sand, situate between Monte-video and Buenos-ayres, are from 3½ to 5 fathoms of water.

Navigation at the Entrance and in the River.

The preceding description indicates the precautions requisite to be taken on approaching the different points of the entrance. On advancing, it is prudent to prefer the north coast, that only being elevated.

Some navigators have pretended that they can always judge of their position without a view of the land, by the depths of the sea, and an inspection of the divers qualities of ground gained by the lead; but this must be incorrect; for, in exploring the offing on all these coasts, soundings were frequently found similar to those off the river; and the resemblance, if depended on, may cause dangerous errors. We therefore advise mariners not to attempt making the river without being previously well assured of their position by observation of latitude and longitude, and always to advance with precaution, on account of Currents which may happen to prevail between the hours of observation.

If the wind be steady from N.E., when you approach Cape Sta. Maria, that will be an advantage which will allow you to reconnoitre a greater extent of coast before entering the river: but, under other circumstances a sight of Lobos is, in the first instance, to be preferred; as you may thus avoid being wind-bound on the north coast, and have a better chance of plying to windward. It has been already noticed that the landfall of Cape Antonio is both difficult to make out and dangerous to approach, unless in favorable weath-

Having arrived to the southward of the Isle Lobos, at the distance of two or three miles, the direct course for the Isle and Lighthouse of Flores will be W. 7° N. true, or W. ½ S. by compass: but, as the Plata is subject to very variable currents, such must be allowed for on approaching the north shore, taking care, at the same time, not to fall too far to the southward or toward the English Bank. On approaching land, you may, in good time, see the round tower of Maldonado and the high lands to the westward; and, in continuing the route, at the distance of 5 or 6 miles off, distinguish a point formed of black rocks, with beaches of sand to the right and left of it. This point, called *Punta Negra,* (Black Point) is situate at 14 miles westward of Maldonado; it is the western point of a great sandy bay, over which the high lands are remarkable, as appearing to rise, like a great white border, from the shore of Maldonado and the extreme points of the bay, *Ballena* and *Negra.*

When you are on the meridian of Punta Negra, at the distance of six miles, the Isle of Flores will again bear W. 7° N. *true,* or W. ½ S. by compass. Here you will have 11 or 12 fathoms of water, oazy bottom, and may thence proceed with perfect safety.

Beyond the lands situate to the north of Punta Negra, the coast makes a break or aperture, and thence becomes very low. On steering in sight of land, you may now distinguish the *Hills of Afilar,* situate in latitude 34° 47′ 15″, and longitude 55° 26′ 15″: when these bear N. by W. (by compass), and the nearest hill of Punta Negra bears N.E., you will be 27 miles eastward of Flores, in 11 or 12 fathoms of water, oazy bottom, and the isle in a line with Lobos. The hills of Afilar are insulated, and resemble two mamelons, or tetas, or paps.

On proceeding upon a course W. ½ S., as above, you may see, from the mast-head, the light-tower on Flores, at the distance of about 12 miles. This isle, when first descried, resembles three islets; afterward the lower part gradually rises from the horizon; and, at five miles off the whole comes in sight. When the sea is high, the isle, when first seen, appears in two portions only.

On coming in by night, you may see the revolving light on Flores, directly a-head, and may approach it to the distance of four miles; then passing it to the southward at two or three miles. Between Flores and the English Bank the bottom is of oaze, and the general depth 6 and 7 fathoms. The distance between is ten miles.

From the Isle Flores to the harbour of Monte-video the distance in a right line is 16 miles W. by S. which will lead clear of the *Punta Brava,* 4 miles to the eastward of that port. This Punta Brava is formed by a line of rocks projecting into the sea. One shoal, detached from the rest, requires a berth on passing. A large white house stands to the north of the point, and a smaller one is situate toward the middle of the rocks.

On leaving Flores, when the weather is clear, the Cerro or Hill of Monte-video comes in sight; and, in some time after, the steeples or towers of the cathedral in the city will be seen.

With the wind from the North or the N.E., you may steer by night to the W. by S. for doubling Point Brava; but with the winds from the S.E. or E.S.E. it will be prudent to steer W.S.W. You ought, in precaution, either in one case or the other, to keep the light on Flores E. by N. or E.N.E., with an assurance that the currents will not set the ship in the direction of Point Brava.

When the Cerro or hill called Monte-video bears N.W. the point will be doubled, and you may proceed on the starboard tack, so as to gain the anchorage. A large vessel, after passing Brava, may proceed W. by S. and find anchorage in the Great Road in 5 fathoms. At a mile to the south of Point Brava are 5 fathoms of water.

In the track from Lobos to Monte-video, as in all those in the interior of the river, the rate of way must be measured by the log, and the current by a boat, in the usual manner, so as to ascertain whether it be in favour of the ship, or otherwise. The route will be modified accordingly.

As all the coast between Punta Negra and Flores may be approached to the distance of 5 or 6 miles, it is best by night to make the tacks on the starboard side. The revolving light on Flores will, in this case, be clearly seen, and you may pass to the southward of it, leaving it at the distance of 4 or 5 miles, which will lead at a sufficient distance from the English Bank, in 6 and 7 fathoms.

The Cerro or Hill of Monte-video is 478 feet high above the level of the sea. On it is established a fixed light, but which cannot be seen, by night, more than 5 or 6 miles off, when the weather is clear.

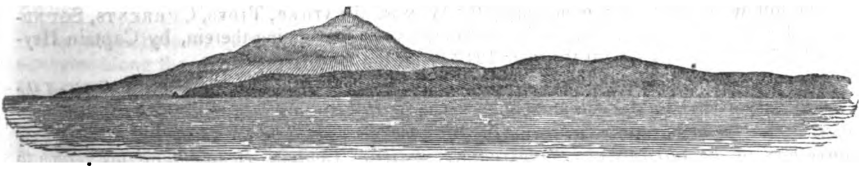
Should you attempt to make Monte-video, by passing to the southward of the English Bank, you must pass this shoal, from the entrance of the river, on the parallel of 35° 30′, steering W. by S. with northerly winds, and W.S.W. with the wind southerly.

On passing over the great bank the soundings will be fine sand, then ordinary sand, afterward oazy sand, and lastly oaze, when over the bank, and on the meridian of Monte-video. You will then, by steering north, gain sight of the mountain, which may be seen by day, in clear weather, nine leagues off. Its position is latitude 34° 53′ 2″, in longitude 56° 11′ 37″.

If, notwithstanding the precautions indicated, you fall on a bottom of 5 fathoms, in passing to the southward of the English Bank, by tacking to the N.W. you will soon after gain from 6 to 8 fathoms.

In thick weather, or if the true situation of the ship be uncertain, in any part of the river, you may always anchor rather than continue your route.

DESCRIPTION of MONTE-VIDEO.—The BAY of MONTE-VIDEO is 2½ miles in extent, and its general depths are from 15 to 9 feet of water. The city, named that of SAN FELIPE, or St. PHILIP, is on the eastern side, as shown on the particular plan of the harbour, and stands on a peninsula; it is strongly fortified, and has a citadel on the east. This place is the capital of the republic of URUGUAY, formerly called the *Banda Oriental*. The population is estimated at about 10,000. A British consul is resident here. The anchoring ground is good, but exposed to the *pamperos* or S.W. winds, which at times, raise the water 6 or 7 feet above the ordinary level. On the western side is the hill from which the harbour derives its name, as already noticed, and on which stands the lighthouse: the other part of the coast is low. The neighbouring country is pleasantly diversified and well watered, but totally bare of trees and without a trace of cultivation. Neither wheat nor maize is raised here; but there are plenty of melons, calabashes, figs, peaches, apples, and quinces; and cattle are as abundant as in any other part of the country. Hence it is an excellent place of refreshment for a crew. The air is generally wholesome, but the winter boisterous and cold, and the summer subject to violent thunder-storms, and heavy rains. The exports to Europe are mostly hides and tallow; to the West-Indies jerked beef.*



Punta Brava, or Bold Point, W. by N. by compass, 12 miles, and Monte-Video Lighthouse appearing over it.

The best anchorage is described by Captain Heywood, hereafter; we therefore only add that there is a shoal in the eastern part of the bay, called *El Bajo de la Familia*, and lying at nine-tenths of a mile N. by E. from the extremity of the eastern point, called that of

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* DECREES FROM MONTE-VIDEO, 1836.—"In consequence of the greater portion of the foreign vessels which arrive from ports in which consuls of the republic reside, and entering their cargoes without having their manifests certified by the said consuls, the government, in order to put a stop to a system so prejudicial, have ordered and decreed:—

"Art. 1.—The captains of merchant-vessels proceeding from foreign ports in which consuls of the Republic reside, who present their manifests without being certified by the said consul, will be subject to an additional duty of 6 per cent. on the value of the goods.

"2.—The decree of the 17th of January, 1834, remains in full force, respecting vessels arriving from ports in which no consul resides.

"3.—They except those from the foregoing vessels which arrive from free ports, to whatsoever nation they belong.

(Signed) OREBE J. M. PEREZ,
J. M. REYERS."

A second decree states that the enforcement of the above would, for vessels from Europe, commence in April, 1836; as also for vessels from America.

San Jose, about which, likewise, there are several rocks. The depths between are from 15 to 9 feet.

Particulars from Mr. Webster's Narrative of the Voyage of the Chanticleer.—The town of Monte-video, more properly St. Philip, stands on a low tongue of land; it is about three-fourths of a mile in length, from E. to W. and half a mile in breadth from N. to S. It is considered as the key of the river, and as such is surrounded by fortifications, and regarded as an important military station. Occupying so small a space as it does, the houses are, necessarily, closely built; the streets are in general straight, and, unlike many Spanish and Portuguese towns, are provided with pavements for foot passengers. Not so the roadway, for this at the best is in a disgraceful condition. The houses are mostly two stories high, and built of brick; they have no gardens, and merely a court-yard, the exterior of them being white-washed. The roofs are all flat, and their sides guarded by a parapet, for the purpose of being used as promenades, as well as for the ladies to arrange their favorite plants and flowers. They form, in fact, the resort of their inmates, who may be seen in the day-time, but particularly in the evening, lounging away their time over coffee or cigars, or witnessing any spectacle that may be passing in the streets.

Here also the merchant, who is interested in shipping affairs, has his *mirador* or look-out station, something resembling a watch-tower, where with its telescope, he sweeps the distant horizon to the eastward, with many an anxious feeling for the safety or expected arrival of some vessel. These miradors, perched on the roofs of the houses, give a peculiar appearance to the town, but they afford a pleasant and airy retreat, and, considering the condition of the streets, are very desirable. House-rent is very high. The shops display neither ornaments nor order, but are, nevertheless, abundantly provided with all the requisites for good living. European merchandize is sold at very reasonable prices, considering the distance it has been brought; and to the general integrity of the shopkeepers, principally Spaniards, I can, says Mr. Webster, advance my humble testimony.

The principal building in the town of Monte-video is the cathedral. It is a capacious and handsome brick building, with a cupola and two towers, rising proudly above the surrounding houses on the western side of the great square, nearly in the very centre of the town. In the square, and facing the cathedral, is the *cabildo*, or town-hall, where public business is transacted. The market, which is held at an early hour every morning in an open area at the western end of the town, is tolerably well supplied with the produce of the country.

The following REMARKS concerning the WINDS, WEATHER, TIDES, CURRENTS, SOUNDINGS, &c. in the RIVER PLATA, with instructions for navigating therein, by Captain Heywood, were first published in the year 1813, with the following preface.

"*Captain P. Heywood, of his Majesty's ship Nereus, having been for three years on the Brasil station, and the greater part of that time in the River Plata, had the opportunity to observe that the loss of many vessels in that river was occasioned by the masters wanting proper directions for its intricate and dangerous navigation. Captain Heywood, on his return to England, very obligingly transmitted to the Committee for managing the affairs at Lloyd's, his observations and instructions for the safe navigation of the Plata; which the Committee are happy to publish (with Captain Heywood's permission) for the benefit of all persons navigating that river.*" *Lloyd's, October*, 1813.

WINDS, &c.—At the entrance of the River Plata, the prevailing winds, during the summer months, from September to March, are north-easterly, with tolerably clear weather over head, but a dense atmosphere near the horizon. These winds haul gradually to the eastward as you advance up the river; and about the full and change of the moon, strong breezes from the south-eastward are common at this season, accompanied with rain and foul weather. At Buenos-Ayres, during the summer months, the S.E. winds are generally fresh in the day-time, hauling round to the northward in the night.

During the winter months, from March to September, the prevailing winds, at the entrance of the Plata, are S.W., or more westerly; but, up the river, more generally from the northward, than the southward, of west.

The winter season is the best, in point of weather, at Buenos Ayres; for, the winds being chiefly from N.W. to S.W., the water is smooth, and the communication can be kept up between the shore and the shipping with more facility. The weather is sometimes, but not frequently, foggy. Fogs are most common in the months of July, August, and September, and prevail more at the entrance of the river, as far up as the S.E. tail of the Ortiz, than above the banks.

TIDES, &c.—As it cannot be said that there are regular tides in the Plata, but currents as uncertain in their duration as they are irregular in their rate and direction, no certain allowance can be made for them; therefore a ground-log should always be used, to know the course made good and distance run.

The tides, speaking generally, when the weather is fine and settled, and winds moderate, do not, in any part of this river, rise or fall more than 5 or 6 feet; though, at Buenos Ayres, at the distance of eight miles from the city, we found in his Majesty's ship Nereus, when the winds were strong at N.W., so little, sometimes, as 15 *feet* water; with strong breezes from E.S.E. to S.S.W., the depth was upward of 5 *fathoms;* but, except on such extraordinary occasions, we had between 17 and 22 feet of water. I have heard, however, some marvellous stories of the river having been almost dried up, across from Buenos Ayres to Colonia, during heavy westerly gales.

Peculiarities of Wind, Tides, and Currents.—The River Plata has many singularities; which I think may, in a great measure, be accounted for, from its formation being so different from any other known river. Its entrance being very wide and very shallow, it is affected by every change of wind in a most extraordinary manner; so much so, that a shift of wind may be predicted almost to a certainty, by observing carefully the state of the mercury in a barometer and the set of the currents, which usually shift before the wind. In *calm* weather the currents are generally very slack; and then as regular, almost, as tides; setting up and down the river alternately. When the winds are variable, the currents are equally so; and I have known the Nereus to be current-rode four different ways in less than six hours. When the current comes in from the eastward, along the north bank of the Plata, a north-easterly wind may, generally, be expected to follow; and at the same time (should the wind have been previously to the S.E.) the mercury in the barometer will fall a *little;* but much more if the transition be quick from south-west without stopping in the south-eastern quarter.

When the wind continues in the north-east quarter, the mercury is more depressed (according to its strength) than with any other wind, and there is usually, *then*, a set *into* the river on the north bank, and *out* on the *opposite*. Indeed, whilst the winds are between N.E. and S.S.E., the current generally runs to the westward, past Monte-Video, though without much augmenting the depth of water off that place, but filling the river above the banks.

The winds between N.N.E. and W.N.W. make the water lowest: the out-set being then strongest along the south bank of the river, past the Points del Indio and Memoria; but very inconsiderable along the north bank.

Before the setting in of a S.W. gale, or *Pampero*, the weather is usually very unsettled, and the winds unsteady and variable in the northern and north-western boards; preceded by a considerable fall in the mercury, though it usually rises a little again before the wind shifts to the south-west; and often continues to rise, even though the wind may increase from that quarter.

Before these winds set in Buenos Ayres, the current runs up and fills the river unusually high; at the same time as strong an out-set is experienced along the north bank, which continues whilst the winds are strongest from W.S.W. to south, seeming to prove that these winds force up, from the southward, a large accumulated body of water past Cape St. Antonio, which can only find a passage out again by the north shore, where they increase the depth of the water, as well as up the river, and particularly in the shallow harbour of Monte-Video. Whilst these S.W. winds blow, the air is cold, and the atmosphere clear and elastic, in a degree rarely to be met with in any other part of the world. They are generally succeeded by some days of fine serene weather; the wind continuing moderate from the southward, or varying to the eastward.

I have never known the velocity of the tide or current, in the River Plata, any where to exceed three knots per hour; but I have heard it said, by some, that they have found it run at the rate of six or seven miles an hour!

As the winds outside the River Plata, and particularly about Cape St. Mary, are most frequently from the north-eastward and northward, except when the S.E. summer and S.W. winter gales blow, about the times of new and full moon, I consider it, on the whole, mo

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advisable for ships bound into the river, to get in with the land about the latitude of that Cape, which is 34° 40′ S., and its longitude 2° 9′ E. of Mount Video.

SOUNDINGS on ADVANCING to the RIVER.—In latitude 33° S. the bank of soundings extends off the land full thirty-six leagues; where the depth of water, in longitude 50° 20′ W., is 94 fathoms; and the quality of the bottom dark olive-coloured mud, or oaze, as it is all along the outermost verge of the bank.*

In latitude 34° S. and thirty leagues from the land, the bank is steep, and the soundings decrease quickly, in standing to the westward, to 25 fathoms, twenty leagues from land.

In latitude 34° 20′ S. and about thirty leagues east of the great Castelhos Rock, the depth is 63 or 64 fathoms, dark mud. In standing in for the land, between the Great Castelhos and Cape St. Mary, the water shoalens, in a short distance, from 60 to 25 fathoms; and the quality of the bottom changes to sand, which grows coarser as you approach the coast; and, as far as seven leagues off shore, is intermixed with shells. This bottom is found only in, and to the northward of, the latitude of Cape St. Mary, unless very close in with it.

To the southward of 34° 40′ S. the bottom is chiefly mud, intermixed with fine sand or gravel; and if a ship happen to be set to the southward of Cape St. Mary, as she hauls in for the land, yet keeps to the northward of Lobos, she will get out of fine sand into dark mud: which is the quality of the bottom (chiefly) between Cape St. Mary and Lobos; as well as eight or nine leagues to the eastward of that island; and the depth of water between them is generally 26 to 20 fathoms.

In latitude 35° S. and longitude 52° W., or forty-two leagues *true* east of Lobos, there are about 90 fathoms of water, dark sandy bottom; from whence the bank of soundings takes a S.W. direction. East of Lobos, twenty-seven leagues, the depth is 25 fathoms; and, in steering in, on its parallel, the same depth, nearly, continues till very near that island. But, if set a little to the southward of Lobos, the water will shoalen even to 10 fathoms, perhaps on a hard, sandy, or gravelly, ridge, that extends all the way from the English Bank, in its parallel, as far as longitude 52° 30′ west; or full eighteen leagues to the eastward of the meridian of Lobos.

Thus the approach to this river cannot be considered dangerous, if proper care be taken in navigating, and due attention paid to the lead, and to the course steered.

Agreeing in opinion with Captain Bouverie, that, generally speaking, it is advisable to make the land about Cape St. Mary, I would also recommend, if the wind should be any where between S.E. and N.N.E. to enter the river on the north side of the English Bank, passing Lobos, on either side, according to the wind and state of the weather. There is a good passage between Lobos and the main, having 17 to 14 fathoms of water.

The island of Lobos is in latitude 35° 1′ S. and longitude 1° 24′ East of the Mount Video. It bears about *S.W.* true, from Cape St. Mary, distance forty-one miles. The variation off it was 13° Easterly in 1813.

When within three or four leagues of Cape St. Mary, in 17 or 18 fathoms, S.S.W. by compass, is a fair course to steer for passing outside of Lobos in the night-time; for, with the wind from the eastward, or N.E., the set along shore into the river must be guarded against. Steering this S.S.W. course, the depth of water will increase to 20 and 22: and some casts, perhaps, of 25 or 27 fathoms, (if you are set neither to the westward nor to the southward of it,) and the bottom will change, first to sandy mud, and then to dark-blue mud, as you approach the latitude of Lobos. If you are set to the southward, in steering S.S.W., you will not deepen so much; the bottom will keep sandy; and when you approach the latitude of Lobos, you will have no more than 19, 18, and 17, fathoms; but if you are set to the southward of Lobos a few miles, you will have hard casts of from 16 to 10 fathoms, and may rest assured of being on the parallel of the English Bank, and may therefore make a west-northerly course *true*, till you find the bottom soften; as it is all dark-blue or greenish mud, in the channel, between the foul ridge of the English Bank and the north shore, all the way up to Monte-Video, in the fairway from Lobos. When off Lobos, if the weather threaten, and it should be likely to blow, a ship will find safe anchorage in the harbour of Maldonado, sheltered from southerly winds by the island of Gorriti, which bears N. 42° W. *true*, eleven or twelve miles from Lobos.

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* The *Laurel's Shoal*, in latitude 36° 28′, longitude 51° 30′, or about 70 leagues from the mouth of the Plata, has been reported as a sandy bank, with heavy breakers, seen in 1822.

LOBOS to FLORES, &c.—Having Lobos bearing N. by W. by compass, distance three or four miles, you will have about 18 fathoms; and in making a compass course, W. ½ S. by ground log, (having due regard to the wind and current at the time,) you will make the island of Flores a-head of you. In this track your soundings will gradually decrease from 18 to 12 fathoms, due south of Black Point, and to 7 or 8 fathoms when you approach within nine or ten miles of Flores.

Though Captain Bouverie says, "You may run quite up to Monte-Video, either by night or day, by making a due west course, first trying the current to make allowance for it;" and though I have frequently done it myself, yet I would not recommend it as a general rule to be followed by strangers to the River Plata. Great care and attention to the course made good, and to the soundings, are indispensibly requisite in those who attempt to conduct vessels during the night, in any part of this river; and even these have been but too often insufficient to save ships from destruction. But, in merchant-vessels, I fear we cannot always expect to find those qualities; and, therefore, I withhold my opinion of its being adviseable for them to run in the night; neither can it be done by men of war without some risk.

Flores bears, by the world, W. 4° 30′ N. from Lobos, distant fifty-two miles. It lies nearly N.E. and S.W.; has a small hummock in the middle, and one at each end: that to the S.W. being thirty-nine feet high. Between these the land is low and marshy; and overflowed sometimes between the central and N.E. hummock. It may be seen at the distance of five or six leagues from a ship's deck in clear weather.*

There is good anchorage all round this island: but a reef extends in a N.W. direction from the north point about a mile. Seals and sea-lions, and various aquatic birds, resort to this small island as well as to Lobos: and, in the months of August and September, great quantities of very excellent eggs may be procured. With the wind easterly, boats may land on the western side of Flores, particularly in a small cove, very near the S.W. part of the island.

ENGLISH BANK.—From Flores, W.N.W., the *Carretas Rocks* (above water) are distant about five miles: and there are 5 fathoms between them. True south, at the distance of eleven miles from Flores, is the north part of the English Bank; on which, in that latitude, 35° 8′ S., there is about 12 feet of water. The depth of water, between Flores and the English Bank, is 7 fathoms, all the way across, to within a very little distance of both. The English Bank, in latitude 35° 12′, generally breaks; and, with a low river, is above water in some places. Its extent, to the southward, has not yet been accurately defined; and, for seventy or eighty miles to the south-eastward of it, the ground is said to be foul and uneven, and has not been sufficiently explored.

Between the Archimedes and the English Bank there is a swatch of 5 fathoms of water, (according to Captain Beaufort of the Royal Navy, who explored these banks in 1807,) and as many miles wide.

The shoalest part of the Archimedes Bank, about 2¾ fathoms, is four miles in extent, about north and south by compass: and there are 4 fathoms all round it. The centre of it is in latitude 35° 12′ S., and the Mount Video bears N. 22° W., by the world, from it, distance twenty miles. Beside this bank, there is a small knoll, in latitude 35° 14′ S., which is true south from the Mount Video, twenty-one miles; and has not more than 3½ fathoms of water on it, and about 4 fathoms all round it.

MONTE-VIDEO.—Passing to the southward of Flores, at the distance of a couple of miles, you have 6½ or 7 fathoms, and may steer W. ½ S. by compass, to pass *Point Brava*, which bears true W. 4° N., distant four leagues, from the S.W. end of Flores. This point is bolder-to than the land to the westward, between it and the town of Monte-Video, and may be passed close, in 4½ or 5 fathoms, at a mile or a mile and a half distance. The best anchorage for a frigate, off the town of Monte-Video, is with Point Brava bearing, by compass, W. by N. ½ N., the cathedral N.E. by N., and the Mount about N.W. by N., in 3½ or 4 fathoms, two miles more from the town, with the harbour quite open. The bottom is all soft mud.

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* The Lighthouse on Flores has already been noticed in page 169.—Ed.

The harbour of Monte-Video is very shoal, having only from fourteen to nineteen feet of water; but the bottom is so very soft, that vessels receive no damage by grounding there. Captain Bouverie says, A S.S.W. wind, which blows right into the harbour, and causes a good deal of sea, always occasions the water to rise a fathom or more.

"In a long continuance of fine weather, the tides sometimes assume the appearance of regularity; but this is not often the case. They are governed entirely by the winds. The winds from the southward cause the water to run out on the north shore strongest. Fine weather, and a N.W. wind, make the water lowest. It is usual in Monte-Video harbour, to have an anchor to the S.E., and another to the S.W. and to take one in abaft from the northward; for the water, forced in by the southerly wind, sometimes rushes out with astonishing rapidity; when the anchorage to the north is of the greatest service."

The Mount-Video is in latitude 34° 53′ S., longitude 1° 24′ W. of the island of Lobos, and 2° 10′ E. from the cathedral of Buenos-Ayres.* On the summit of this mount is a fortified building, whose base is forty-two feet six inches by twenty feet, and now used for a lighthouse. The diameter of the lantern is ten feet six inches, and its elevation above the level of the sea 450 feet. At the base of the mount are several runs of excellent water, particularly in two small smooth sandy bays on the S.W. part of it, where ships in the outer roads may supply themselves with ease; and another on the east side of the mount, just abreast of the *Isla Ratones* or Rat Island, adapted to ships in the harbour.

Giving the preference to the passage on the south side of Flores, especially when the wind is any where between S.S.E. and N.N.E. on passing Lobos, because it may be expected most probably to shift, if it does at all, round by the north to the westward; though, perhaps, not before that wind, that the in-set, together, might carry a ship up to Monte-Video; yet if the wind should be to the *north-westward* at the time of making the land, it may be pretty confidently expected to shift next to the westward or S.W.; and therefore a ship should not strive to beat up, round Lobos and the north channel, against an out-set, but stand at once over toward Cape St. Antonio; where, by the time she could stretch across, she would, most likely, find a S.S.W. wind and N.W. current to run up with, along a weather shore, to Buenos-Ayres; or to Monte-Video, if bound thither, passing to the westward of the bank of Archimedes, in about 5 fathoms of water; or, if the mount should be seen in good time, never to bring it to bear to the westward of North, by compass, till within five leagues of it.

Navigation Southward of the English Bank.—*In standing to the southward, from abreast of Cape St. Mary, with the wind south-westerly,* a ship will have from 18 to 24 or 25 fathoms when in the latitude of Lobos, and about twelve or thirteen leagues to the eastward of it; and making a S.S.E. course, the water will then shoalen to 18, 16, 12, or 11, fathoms, in crossing the ridge, which is generally composed of sand, gray speckled, mixed with stones, hereabout; after which the depth increases gradually to 35 or 36 fathoms, over a sandy bottom, in latitude 35° 40′ S., and longitude 53° 25′ W. In the latitude of 36° S. and fifteen or twenty miles farther to the eastward, you will deepen off the bank entirely. A ship, having got as far to the southward as 36° S., may consider herself in a fair way for proceeding up on the south side of the English Bank; and, if the wind serve, a true West course may be made good.

In latitude 36° S. the depth of water on the meridian of Cape St. Mary is 38 fathoms; and the bottom fine gray sand, like ground pepper.

Keeping still to the westward, on that parallel of 36° S., the depth decreases to 19 or 18 fathoms, true South of Lobos; and for ten leagues farther you have from that to 15 fathoms. But if from the latitude of 36° S. on the meridian of Lobos, you make W. by N., or W. by N. ½ N. course *true*, you will shoalen the water to 8 or 7½ fathoms, in latitude 35° 45′ S., on the meridian of the English Bank. The quality of the bottom, generally, in this track is sandy, mixed with small stones; and the nearer you approach to the ridge of the English Bank it is intermixed with bits of shells, and sometimes with clay or mud.

From latitude 35° 45′ S., due S. of the English Bank, a W.N.W. true course to latitude 35° 33′ S. will bring the Mount Video to bear North by the world, in about 6½ fathoms, mud, at the distance of thirteen leagues from Point Piedras: and from this position the same true course may be made to raise the land about Point del Indio, if bound up to Buenos Ayres; or N.W., or more northerly, to get sight of the Mount Video; having due regard to the set of the current, up or down the river, that you may neither be horsed on the S.E. tail of the Ortiz Flats, nor on the western part of the Archimedes Bank. The bottom above this is soft mud, or clay, in the channels, fit for safe anchorage. In latitude 35° 30′ S., or thereabout, and due South of the Archimedes Bank, or some miles farther to the eastward, I have been told by some persons they have had as little as 4 fathoms, hard ground.*

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* It may be observed that we give this as written by Captain Heywood.—Ed.

MONTE-VIDEO to BUENOS-AYRES.—Ships leaving Monte Video, to proceed up to Buenos-Ayres, must be very attentive to the lead; and the course steered across the river must be very carefully regulated by the set of current at the time. If the weather be sufficiently clear, the Mount is the most sure guide, keeping it by an azimuth compass, on the magnetic bearing N.E. by N.; and when it sinks to an eye in the top, a more westerly course may be steered to raise the land about *Point del Indio.* This direction is intended to apply particularly to frigates, or any ships drawing more than sixteen feet of water; because it is not adviseable for them to cross the tail of the Ortiz Flats much farther to the westward than a true S.W. course from the mount will take them; for, with a low river, I have had barely 3¼ fathoms, in the Nereus, with the mount bearing N. 35° E., by compass, distant ten leagues. At other times, I have sunk the mount on a N. 53° E. magnetic bearing, and had as much as 3½ fathoms; but the river was then well filled.

On the south-eastern part of the Ortiz Bank, which is there hard stony sand, there was formerly part of a mast, or beacon, about twelve or thirteen feet high, in latitude 35° 2′ 15″ S., and 0° 45′ West of Mount Video; from which it bore W. 14° by the world, thirty-seven miles. There were about twelve or thirteen feet alongside of it; 3 fathoms two miles to the eastward of it; but not more than ten or twelve feet, as far as three miles S.W. of it. Point del Indio bore true S. 33° W., sixteen or seventeen miles from it.

For the distance of full seventeen miles to the south-eastward of the S.E. end of the Ortiz there is generally no more, and often less, than 3½ fathoms; the bottom tough clay, nearest the bank; and in some places farther to the south-eastward, soft mud, not more than 3¼ fathoms.

After sinking the mount about N.E. by N., and having 3½ fathoms, a W.S.W. course will raise the land (if the weather be clear) about Point del Indio to the eye at the mast-head; and probably you will not have more than 3¼, or, at best, 3½ fathoms. The mount and land near Point del Indio are sometimes visible at the same time.

Point del Indio is in latitude about 35° 16′ S. and 0° 56′ W. of the Mount Video, from which it bears S. 63° W. by the world, distant fifty miles. There is little more than 3 fathoms at the distance of ten or eleven miles, when the river is in a mean state; farther to the southward, and off Point Piedras, there is only that depth fourteen or fifteen miles off shore. Very great caution, therefore, is required in approaching it; and a constant look-out should be kept for the land, as it is very low, and cannot be seen farther than twelve or thirteen miles, in any weather, from the deck of a frigate.

When the land is barely raised to an eye nineteen or twenty feet above the surface of the water, a W.N.W. magnetic course will lead along-shore, between it and the south part of the Ortiz, which is distant about fourteen miles from it; and between them there is no where more water than 3½, but mostly 3¼, fathoms. With a high river, I have had a quarter-less 4 fathoms. The nearer the Ortiz, the deeper the water.

In steering up W.N.W. with the land seen from the deck, (if clear weather,) you will have 3½ or 3¼ fathoms, (yet if the river is low, perhaps some casts of 3 fathoms,) and raise a remarkable clump of trees, called *Embudo*;† which are much taller than the rest, highest at the west end, and lie in latitude 35° 6′ S.; and in longitude 1° 16′ 30″ West of the Mount Video, or 0° 57′ 30″ East of the cathedral of Buenos Ayres. At some distance to the westward of the Embudo trees, there is another clump about the same height; but these being highest at the east end, are sufficiently distinguished not to be mistaken for the true Embudo.

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* The Bank of four fathoms is represented on the charts as extending 8 miles N. and S. by 3½ in breadth, between the latitudes of 35° 29′ and 35° 36′.—Ed.

† The *Ombu trees* mentioned by M. Barral.

When in 3½ or 3¼ fathoms, the Embudo trees bear by compass W.S.W.; the S.E. end of the Chico Bank will bear W.N.W. or thereabout, ten or eleven miles from you; and you must now determine from the water your ship draws, and the then direction of the wind and state of the weather, whether you will pass between the Chico and the shore, or between the Ortiz and the Chico. I have passed up and down several times between the Chico and the south shore in the Nereus, lightened in her draught to eighteen feet three inches; but I would never attempt it again from choice, now I am better acquainted with the middle channel between the Chico and the Ortiz, and have every reason to believe that the middle-ground, some charts lay down in it, does not exist.

A ship not drawing more than fifteen feet may take either passage; and, of the two, ought perhaps to prefer that to the southward of the Chico Bank, particularly if the wind should be well to the southward, as she might take her soundings from the weather shore, and, keeping in somewhat more than her own draught, run up along it; and, by not deepening above three fathoms, would ensure being to the southward of the Chico.

Chico Bank, &c.—The S.E. end of the Chico Bank bears from the Embudo trees N. 32° E. *true*, distant ten miles, and E. 9° N. thirteen miles from Atalaya church. Its latitude there is 34° 56′ 30″ S., and longitude 1° 9′ W. of the Mount Video. This bank runs in the direction of N. 52° W. *true*, or N. 65° W. by compass, about thirteen miles to its N.W. end, which is in latitude 34° 48′ 50″ S., and 0° 47′ East of Buenos Ayres cathedral. From this N.W. end, in fourteen feet water, Atalaya church bears S. 14° W., distant eleven miles; and Point Santiago, forming the Ensenada de Barragan, bears W. 4° N. fourteen miles from it. The breadth of the Chico does not exceed two miles, or perhaps a mile and a half, and its inner edge is about nine miles from the shore. The water between it and the shore is no where more than 3½ fathoms, and the deepest water is along the inner edge of the shoal, at the distance of half a mile from it, or less in some places. About midway between it and the shore there is a quarter-less 3 fathoms. On some parts of the Chico there is very little water, and within the limits I have assigned to it, no where more than fourteen feet.

To ships drawing less than fifteen feet, it is only further necessary to recommend care and attention on approaching *Point St. Iago*, which forms bushy and distinct; and when it is brought to bear to the south-westward, haul out into the stream of 3½ fathoms, to round outside the Spit, which runs about N.W. by compass from Point St. Iago, at least ten or eleven miles; its extreme point, in 2 fathoms, being about five miles from the shore. When two remarkable trees on Point Lara are brought to bear S. by E. ½ E., or S.S.E. by compass, you are past the Spit. This mark will also lead a ship of that draught of water clear to the westward of the Spit, in running in towards the Enseneda.

After passing the spit off Point St. Iago, in 3½ fathoms, a W. by N. northerly course by compass will lead up to the outer road of Buenos Ayres, where any ship may safely anchor in the water she draws, if the river be low.

Frigates, or any vessels drawing more than sixteen feet of water, should barely raise the land about Point del Indio to the eye on deck, and borrow nearest the Ortiz: more particularly when the Embudo trees are brought to bear as far as S.W. by W. (magnetic;) for, with the Embudo bearing from S.W. to S.S.W., the bottom is flat, off to three fathoms, full seven miles from the shore, and chiefly hard clay. Therefore, when the Embudo trees bear W.S.W. by compass, and you are about nine or ten miles off shore, in 3½ fathoms, if you have a leading wind, haul to the N.W. by W., or more northerly, as may be required to clear the S.E. tail of the Chico, and you will soon deepen your water to four fathoms, and more, in the middle channel, between the Chico and the Ortiz Shoal. The fair course through, between them, is about N.W. by W. ½ W. (magnetic,) and in mid-channel the land can but just be distinguished from the quarter-deck of a frigate. When the Embudo trees bear S. 20° W. by compass, you will be abreast of the S.E. end of the Chico, and may either take your shoal soundings along its northern or outer edge, to about a quarter-less four, if the wind is southerly, or if the wind be northerly or easterly, borrow

VIEW OF BUENOS-AYRES, FROM THE NEREUS' ANCHORAGE IN THE OUTER ROAD.

REFERENCES.—1, *Residencia.*—2, *S. Domingo.*—3, *S. Francisco.*—4, *Cabildo.*—5, *Cathedral.*—6, *S. Miguel and Mole Head:*—7, *S. Merced.*—8, *Santa Catalina.*—9, *Socorro Chapel.*—10, *Recoleta Spire.*

borrow into a convenient depth along the southern edge of the Ortiz. I believe the breadth of this middle channel may be five or six miles, and the depth of water from 4 to 5½, and even 6, fathoms, in the fair-way, about the N.W. part of it, and abreast that end of the Chico. The quality of the ground all the way through this channel is generally soft mud, and fit for safe anchorage.

BUENOS-AYRES.—The N.W. pitch of the Chico Bank being passed, and the depth of water 5 or 5½ fathoms, you may steer by compass W. by N. ½ N., or W. by N., for BUENOS-AYRES, taking care not to shoalen under quarter-less four, off the Ensenada de Barragan, till *Point Lara trees* bear S.S.E.

At a little more than half way from Point Lara toward Buenos-Ayres, in the *Nereus*, in 19 feet of water, and the bottom soft mud, these trees bore, by compass, S. 17° E., the cathedral S. 67° W., and the spire of the Recoleta convent S. 76° W.: the latitude observed was 34° 34′ 30″ S., and the longitude by the moon 58° 2′ West of Greenwich.* Variation of the compass, 12½° easterly, at the distance of 8 miles from the cathedral. P. HEYWOOD.

Nereus, Buenos-Ayres, July, 1813.

DESCRIPTION OF BUENOS-AYRES.—BUENOS-AYRES derives its name from its healthy climate.—Its port is so shallow that, as shown by Captain Heywood, large vessels anchor at 8 miles to the eastward, near the spot from which the annexed view was taken. Here they discharge their cargoes into lighters or small craft, which reach the town by the channel formed by the sands, the depths in which are from 13 to 12, 10, and 8 feet. The entrance of this channel is two leagues West [*W.N.W.¾ W.*] from the Nereus' or outer anchorage, and here vessels anchor in from 14 to 16 feet. To pass hence into the *Inner Road*, which is a mile north from the city, and three miles farther in, they round the sand on the larboard side, and in not less than 10, 12, and 14, feet of water. In this road the depths are from 9 to 13 feet, and this depth continues more than a mile farther to the southward, where the channel, formed by the bank, is a mile in breadth.

The city, at a distance, has a stately aspect; its situation is agreeable: but the houses, in general, are very low, having no more than a ground floor, with large court-yards, and mostly with a garden. The citadel, which includes the governor's palace, is upon the shore of the river, and forms one of the sides of the Great Square, opposite to which the town-hall is situated; the cathedral and episcopal palace occupy the other two sides of the square, in which a public market is held daily. The flat on which the city stands is only from 15 to 20 feet above the level of the water. The city is regularly built, has several handsome squares, with streets straight and broad, having raised foot paths on each side, but unpaved in the middle, and so soft, that, in rainy weather, they are frequently impassable, from ponds of mud. The population is estimated at 70,000. A British consul-general and two vice-consuls reside here, and there are many British, of different classes, also French, Italians, &c. The environs are well cultivated: most of the inhabitants have their *quintas* or country seats, and market-gardens furnish the necessaries of life in abundance.

The atmosphere around Buenos-Ayres is so moist that the floors of the rooms exposed to the south are always damp.—Walls having the same aspect are covered with moss, and the roofs with grass. This humidity is not, however, prejudicial to health.

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* We now make it 58° 10′ W.

In the *quintas* are raised all kinds of fruit and vegetables; among which peaches are remarkably abundant. Melons and water melons are also abundant and cheap. Other fruits are grapes, apples, pears, figs, nectarines, pomegranates, quinces, apricots, oranges, and lemons. The common vegetables of Europe, potatoes excepted, are sold in the market, but are not cheap, as labour is dear. The chief exports are hides and tallow. The imports, manufactured goods.*

Of the inhabitants, the ladies are more particularly to be noticed.—The majority are brunettes, elegant in person and manners. There is nothing like vulgarity in the appearance of the poorest woman among them. All the men in tolerable circumstances, now dress in the English fashion, and in English manufactures; but others slightly, in the Indian mode. Both males and females have, in general, excellent capacities, but they have been little improved by education, from want of schools and liberal establishments; it has however, been noticed by a traveller, to whom we are indebted for these remarks, that, in spite of all obstacles, many young creoles may be found who have improved themselves amazingly within a few years.

The republican æra of this country commenced on the 25th of May, 1810.—It was soon after decreed that no more slaves should be brought into the country, and that all persons, of what colour soever, born after that date, should be free. Under the new system the monastic establishments are declining, and tithes have been abolished.

NAVIGATION EASTWARD OF THE RIVER PLATA.

In Captain Beechey's remarks on the Passage of H.M.S. *Blossom*, from *Rio Janeiro* to the *Falkland Islands*, 1825, are the following observations on crossing the parallels of the Rio Plata, and encountering the Pamperos, &c.

"This passage was unusually long, owing to the prevalence of contrary winds, particularly in the vicinity of the River Plata. We sailed from Rio Janeiro on the night of the 15th of August, with a westerly wind, the *Corcovado* and *Sugar-loaf* capped with clouds. On the 16th the wind shifted to the eastward; and toward night a gale suddenly arose, accompanied with thunder and lightning. The flashes of lightning passed frequently between the masts; and latterly the electric fluid settled upon the mast-heads and topsail-yard-arms, and remained there for fifteen minutes. We had been warned of the approach of this storm by the appearance of the sky and a few flashes of lightning, and reduced our sail in time, otherwise it might have done much mischief from the suddenness and violence with which it commenced. This breeze went round to North and N.W. to W. by S., then to S.E., S.S.W., N.W., southerly again, and S.E., East, and S. by W., until the 25th, the weather being more gloomy, and the winds light or of moderate strength.

"On the 25th, in latitude 36° and longitude 48° W., we encountered the first *Pampero*, which came on with a heavy squall from the S.S.W. attended with rain. For nine days we had these winds; during which time we could seldom carry more than the maintopsail, in consequence of the violence of the squalls. At the commencement of this bad weather, the squalls were harder and more frequent than toward its termination, and were accompanied with rain, hail, and sleet. Toward the close of it the general strength of the wind was increased, but the violence of the squalls was comparatively moderate, and the intervals longer. Still these gusts of wind gave no warning, and, indeed, during the whole period, excepting in the squalls, there was a clear blue sky, and apparently fine weather. From the commencement of these pamperos to their termination, we had a reduction of nineteen degrees in the temperature of the air, and of fifteen in the surface of the sea. The remarks of Captain Heywood will be found very useful in anticipating these squalls.

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* The ratification of the commercial treaty between Great Britain and the Independent provinces of Rio de la Plata was signed on the 19th of February, 1825: and thus, to use the words of the British consul, "that country is placed in the rank of the nations recognized in the world." The treaty stipulates perpetual friendship between the dominions and subjects of the contracting parties; reciprocal freedom of trade; liberty of conscience; and the exercise of religion, public or private, conformable to the system of toleration established in England. The free disposal of property is mutually agreed to; and the United Provinces, anxious to co-operate with this country in the total abolition of the slave-trade, have prohibited all persons residing in the United Provinces, or subject to their jurisdiction, in the most effectual manner, and by the most solemn laws, from taking any part in the said traffic. It is also stipulated that in case of any unfortunate interruption of the amicable relations of commerce, or a breach between the two parties, the subjects and citizens of each shall remain and continue their trade without interruption, so long as they do not offend the laws; and their effects and property shall not be subject to embargo and sequestration.

"To these pamperos succeeded a calm, then light and moderate breezes from N.W., E.N.E., North, E.N.E., S.W., S.E. with cloudy weather, until in latitude 48° S., and longitude 54° W., when we fell in with a W.N.W. wind, which the next day carried us into the soundings off the Falkland Islands."*

To the preceding we may, with propriety, add—

THE PASSAGE of H.M.S. CONWAY, Captain BASIL HALL, from RIO JANEIRO to BUENOS-AYRES, in October, 1820.

This passage was made in less time than it usually occupies. We passed the *Sugar-loaf* at the entrance of Rio about four o'clock in the afternoon of Saturday the 14th of October, 1820, and were off *Maldonado* at the same hour on that day week, viz. the 21st, and anchored off Buenos-ayres at four in the morning of Monday the 23d; thus completing seven days from Rio to the Plata, and eight and a half from Rio to Buenos-ayres.

The wind was moderate from E.S.E. as far as latitude 26° 46′ S. when it drew to N.E., and blew fresh; it then hauled gradually to the northward. In 33° it fell light, and drew to the westward, south, and so round to the eastward. On approaching the river it came to the southward again, after entering which the wind came from the S.E., and afterward N.E. and East, moderate and fine weather.

An American frigate, which sailed from Rio a fortnight before us, met with hard S.W. breezes, and arrived only two days before us.†

Two years afterward the *Conway*, then returning to Rio, was off the Plata, between the latitudes of 40° and 30° S. for thirteen days, contending against northerly and N.N.W.ly winds, between longitudes 40° and 50°. This was the latter end of August and beginning of September, 1822; and it may be useful to remark that, on this occasion, the winds invariably followed the course of the sun, that is from right to left, or what is technically called, in the northern hemisphere, against the sun. This change occurred three different times; the wind drawing from N.E. to north, then to N.W. and West, and so to S.W., and again by S.E. to N.E. and North. Upon two occasions it shifted to S.W. from the northward, without any warning, and blew fresh.

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* It has been stated that sometimes such swarms of flies are blown off the coast about the entrance of the Rio Plata, as to resemble a small dense black cloud, which is invariably followed by a *Pampero*.

In the Eastern Seas swarms of large flies sometimes come on board vessels, and a typhoon is sure to follow. An eye-witness said, "There were three Indiamen of us in company; typhoon-flies flew on board our ship, the weather was very fine, and no appearance of a gale, and all of us were surprised when our old experienced captain immediately set us to work, to send down royals, topgallant masts, &c., which we had scarcely accomplished, when a tremendous hurricane came on. We were obliged to keep the ship right before it for a long time. When it came on our commander was on the forecastle, giving some orders, and the force of the wind was such that he was unable to return to the quarter deck for about four hours.

"The other ships suffered severely, losing topmasts, &c., but we escaped, owing to the experience of our captain, and his prudent measures, which commenced as soon as ever the flies were noticed."

Mr. Luccock says, In the latitude of 34° South, and fully 200 miles from land, we found the rigging covered, one morning, with a multitude of small insects; some of them very beautiful. We had no doubt of their being brought from the land by a N.W. wind, which then began to blow fresh, but wondered at the distance to which they had been wafted. They were the precursors of one of the most durable gales which I ever experienced; it lasted ten days, with more or less violence, during which we drifted to 36½° South.—*Luccock's Brasil.*

† The Conway crossed the parallel of 30° S. in about 47° 40′ W.—ED.

SECTION V.

ROUTES *for* RETURNING *from* BRASIL *to* EUROPE.

As the *Land-Breezes* of Brasil are nearly the same along the whole of the coast, and during the greater part of the year, the day and hour of departure may be always fixed. It has been noticed that these breezes rise during the night, and are generally very fresh during the early part of the day; as they continue for nine or ten hours, you have consequently every advantage for preparation, and for standing off to a distance from the coast, free from all local obstacles.

The Baron Roussin has treated rather copiously on the routes to be adopted in sailing, from the different ports; but his rules appear to be such as will naturally suggest themselves to the mind of a seaman, on a consideration of the prevalent winds, currents, &c.

The strength of the N.E. winds often force vessels when bound from ports *South of Cape Frio*, on their return to Europe, to keep close on the larboard tack for twelve or fifteen days and descend to the S.E. or S.S.E. to the parallel of 28, or even of 32 degrees.* In advancing from the southward, you ought to attain the meridian of, and sight the island of Trinidad, in 20° 31′ South and 29° 19′ West; then tack about and leave the island on the starboard side, as you cannot always double the projecting points on the eastern shore. On proceeding hence, northward, the winds will be found nearly approaching East and S.E., and so facilitate the proper route. By acting in this way, it will rarely happen that you cannot pass to windward of the isle Fernando Noronha, and cross the line between the 28th and 36th degrees of longitude (west of Greenwich,) or, if circumstances require it, one or two degrees more to the West.

On *quitting Pernambuco*, or the points in its vicinity, you may not always be able to get to the northward on the starboard tack. The direction of this coast inclines from the north to the west, and the winds are mostly from the eastward; but, at the same time, you may gain a good offing in directing your course to the northward. Should, however, the winds not permit you to proceed freely on this route, it will be preferable to make a long board to the S.E., and then act according to circumstances.

THE NORTHERN COAST.

Between POINT TOIRO (*the N.E. extremity of Brasil*) and the isle of *Maranham* the general direction of the coast is W.N.W., and there is no difficulty in proceeding along it with the prevailing winds. During five-sixths of the year these winds blow from E.S.E. to E.N.E., and it is easy to go to the north, and to even gain a little to the east, by governing the starboard tacks.

In *quitting the port of Maranham*, and proceeding thence northward, a favorable wind is required, and care must be taken to avoid the dangerous shoal of *Manoel Luis*, described in page 84. By anchoring for thirty hours, near the edge of this shoal, it was found that the tides set regularly six hours each way, the flood to the S.W., and the ebb to the N.E., nearly with the same strength. The rise and fall was 12 feet. These remarks have been confirmed by others made by Lieut. Lartigue, in a vessel called the *Lyonnaise*, in 1826, who found the alternate streams to run at the rate of one mile an hour.

The combination of tide and current hereabout renders it necessary to be very circumspect when entering and leaving the Bay of S. Marcos, or in sailing between it and the shoal of Manoel Luis, as the streams may be very variable.

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* RIO JANEIRO to CAPE FRIO, &c.—Mr. Wood says, Between the months of September and March, when the northerly winds prevail, as well as a current to the southward, it is advisable, after doubling Cape Frio, to stand to the eastward into the tracks of the Indiamen, endeavouring, if possible, to keep within the tropic; as it is of little service to go round unless you can weather the land on the other tack, as the wind always heads you as you draw in-shore, besides a current on your weather bow.

The Tartar was, (by observation daily,) affected by the *Equatorial current* between the latitudes of 0° 8′ N. and 4° 53′ N. (longitude 24° 30′ W.) in a period of three days, 87 miles N. 44° 27′ W. *true*; equal to 29 miles per day. *Nov.* 1825,

Remarks

Remarks *on the* Passage *from* Brasil *to* England, *from the Narrative of a Passenger, on a Voyage from New South Wales, in* 1824.

1824.—*April* 12.—On this day we crossed the tropic of Capricorn, and I saw the Great Bear for the first time, for more than seven years:—On the 20th the land was in sight, the city of S. Salvador, in the province of Bahia. Two ships were in sight, also standing for the harbour; and, in the afternoon, we came to anchor there.

We sailed from Bahia in the afternoon of the 26th of April, with a S.E. wind and showery weather; and so the wind and weather continued, and prevented us from clearing the land till the 3d day of May. In addition to this foulness of wind we now found a foul ship. On the 5th of May, in the evening, we passed the high pyramidal peak of the island Fernando Noronha, distant 6 or 7 leagues to the eastward, rising like a spire.

On the 8th of May we crossed the line, in the longitude of 32° 30′, and were becalmed for only two days, with rain for only one; after which we had the N.E. trade-wind till the 2d of June, when we were in the latitude of 35° 55′. On the 13th of May the wind was light, with heavy rain all day; and, on the next evening, which was showery, we saw a *lunar rainbow*, a phenomenon which I had witnessed only once before, and which many people die of old age without seeing.

On the 24th of May we crossed the tropic of Cancer; and on that and the three following days the sea-weed was very abundant. When gathered, small crabs and shrimps as usual came up among it.

On the 30th of May, the wind being light and the weather fair, we saw half a dozen dolphins, with their ultramarine blue bodies and their orange-green tails; but they would not bite a bait. We also passed a brig.

Eight weeks have now elapsed, during which we have had the thermometer from 75° to 83°, both night and day. From this time the heat fell to a common English summer temperature.

On the next day, (31st,) which was rainy and cloudy, instead of dolphins, stormy petrels were very numerous under the stern of the ship; and, on the following day, came a strong breeze and a high sea, producing heavy rolling. We passed a schooner, showing English colours. The day after the sea was still high, and the wind fresh at N.W., with heavy rain in the evening, which latter continued the next day. With the exception of one day, we had now a fair wind till we entered the English Channel. On the 4th of June we passed a brig, which afterward overtook and spoke us; namely, the *Nocton Packet*, from the island of St. Thomas to England. On the next day the wind was stronger, and the ship more uneasy and wet than ever: we were out of the Gulf Stream, and on the following morning passed the islands of Flores and Corvo, the two north-westernmost of the Azores, or Western Islands. Flores looked verdant; but Corvo little better than a lofty rock.

We were now drawing near home, and the converging of outward and homeward bound vessels. On the 9th of June we passed a ship, and on the next day met a large one; on the 13th we met a brig, and saw two or three other vessels in the Chops of the Channel. The next day a vessel was in sight, and the sea was *green*, the ship being in soundings. We were out of blue water. The following morning several vessels were in sight: in the afternoon we saw the land, Start Point, in Old England; and, late at night, we discerned the lights of Portland.

THE END.

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BY JOHN PURDY, HYDR.

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LONDON:
PRINTED FOR R. H. LAURIE,
Chart-ſeller to the Admiralty, the Honorable Corporation of Trinity-Houſe, &c.
NO. 53, FLEET STREET.

1838.

568

⁂ COMMUNICATIONS, FOR THE FUTURE IMPROVEMENT OF THIS WORK, ARE RESPECTFULLY SOLICITED.

[Entered at Stationers' Hall.]

ERRATA.

Page 77, in the Note, for Marquis read Duke.

Page 79. Sunderland Lights. An additional light, apparently red, was established in 1838, as shown in the description of Lighthouses, page xi.

Page 150, *Vissengen*, attached to the View, to be *Vlissingen*.

PRINTED BY J. RIDER, 14, BARTHOLOMEW CLOSE, LONDON.

ADVERTISEMENT.

IN the compilation of the following Descriptions and Directions, it has been our endeavour to unite, in a new, clear, and methodical, arrangement, brevity of expression with comprehensive information; to exclude all matter which might be deemed superfluous; but, at the same time, to combine ALL THAT IS USEFUL, in as brief and perspicuous a form as the subject seems to admit. The reader will perceive that, throughout, the Description of Land, Shoals, &c., precedes the Sailing Directions, which are followed by a Description of the Tides; all under distinct heads: so that each elucidates the other. The courses and bearings are by compass, according to the present variation of the magnetic needle.

The accompanying Chart has also been drawn from the best materials, and with extraordinary care, although unadorned by extraordinary embellishments. It will, consequently, be found free of some very extensive and dangerous Errors, which have heretofore deceived mariners in the navigation of the North-Sea; especially on the coasts of Holland, Denmark, and Norway; or, rather, between these coasts and Great Britain.

The reflecting reader will not consider the last remark as superfluous: Within a few years, during the late war, the British Navy lost eight ships of the line, seven frigates, and twelve sloops, in the North Sea: and of this number, four of the line, five frigates, and seven sloops, were lost on the Haaks and Coast of Holland.

This statement is given for the purpose of producing caution; more especially in regard to the currents, which set as described in the work.

GRATIFIED by the favorable reception given, generally, to the former editions, as well as by the particular communication of several copious and valuable Additions, the Editor has carefully incorporated with these, in the present one, Descriptions of the recent Improvements, as *Light-houses, Light-vessels, Beacons, &c.*, together with various corrections from new Surveys, &c., to the present time. It will be found, on comparison, that these are equally numerous and important, owing principally to the incessant attention of the Honorable Corporation of TRINITY HOUSE, and to the skill and vigilance of the ADMIRALTY SURVEYORS, by whom some extensive dangers, not previously supposed to exist, have been made known.

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THE PHARONOLOGY:

OR, DESCRIPTION of LIGHT-HOUSES, LIGHT-VESSELS, &c. *with the pages in which they are more fully described in the following work.*

LIGHTHOUSES, IN GENERAL.—The lighthouses hereafter described, are mostly on the improved construction, but varying in height, colour, and figure, as well as in the intensity and apparent colour of the light; and they may be classed according to the distances from which the light may be seen in the clearest weather. We use the word *brilliant*, to express a light of the natural colour, and which, when condensed and seen from a great distance, appears like a bright star above the horizon. Lights of this description, sufficiently elevated, may be seen at a distance of seven or eight leagues; those of a second class, at five or six leagues; those of the third, at three or four leagues. Of the last are those which we generally denominate *Harbour-lights*. *Tide-lights*, seen at four or five miles off, are kept up only at certain times of the tide, when vessels of a specified draught may enter, and to these lights particular signals are frequently annexed. Flags, mostly of red or blue, are generally exhibited in the day-time in the tide harbours, during the term of tide denoted by lights in the night.

LIGHT-VESSELS, OR FLOATING-LIGHTS, form a distinct class; these are illuminated, and distinguished by having one, two, or three, lanterns, and which appear steady or in motion, according to the weather or agitation of the sea. These vessels show a ball or flag by day, and are furnished with gongs or bells, to be sounded or tolled in foggy weather, or when snow showers render them invisible from any distance.

Every Trinity Light-vessel is painted *red;* the name of her station is painted on her sides; and, for its flag of a *red colour*, formerly exhibited, a *ball* of the same colour is hoisted at the main-mast head, which, in the event of the vessel's driving from its proper station, is to be taken down. *(Official Notice, 27th Sept.* 1837.*)*

NOTICE was given, dated *Trinity House, London*, 25th of January, 1832, that the *bells* which it had been the usage to ring in foggy weather, on board the Floating-Light-vessels belonging to the corporation, had been removed, and *Chinese Gongs* placed instead thereof.

These instruments will be sounded during fogs, at *regular intervals of ten minutes*, and will, it is expected, by the power and great peculiarity of the sound which they emit, effectually warn the mariner of his proximity to some one of the corporation's Light-vessels, or other light establishment at which they may be hereafter adopted: and in reference thereto, notice was also given, that it is the intention of the corporation, that gongs shall be furnished for the like purpose, at certain of the lighthouse stations, the particulars of which will be hereafter advertised.

BEACONS, BUOYS, &c.—Beacons and buoys are of various forms and colours, as shown in the ensuing descriptions; but here it may be noticed, that nun-buoys, of a *green* colour, are now exclusively used by the Trinity-House to denote the situation of *Wrecks*. Here, too, it may be noticed that, in lieu of vanes attached to buoys, *balls* or *globes* will, in general, be hereafter substituted; being more durable and equally effective: and, in place of a *number*, by which a buoy was formerly distinguished, the *name* is now painted thereon:

N.B. By the Act 6 Geo. IV. cap. 125, any person who shall run down, or run foul of, any buoy or beacon, shall be liable to a penalty not exceeding 50*l.*, nor less than 10*l.*, in addition to the expense of replacing the same, or making good the damage so occasioned.

The NORE LIGHT-VESSEL, moored in 3 fathoms, at the eastern extremity of the *Nore Sand*, exhibits one brilliant light by night and a red ball by day. The vessel is painted *red*, as above described, with the word NORE, in white letters, on each side. A gong is sounded in thick weather, every ten minutes. The height of the lantern above the level of the water is 33 feet, and the light may be seen at 10 miles off. *See pages* 20 and 21.

WEST SWIN.—Two Light-vessels, intended for the West Swin, were preparing in March, 1838; one of them was expected to be placed on the Flat of the Mouse, and the other at a few miles to the N.E., near the elbow of the Maplin: but the future situations were not exactly fixed when this work was committed to the press.

SWIN MIDDLE.—A Floating Light at 4½ miles N.E. by E., easterly, from the Sheers Beacon, with one brilliant light at 36 feet above the water, and a red ball at the mast-head, &c. as above explained. *Page* 23.

SUNK LIGHT-VESSEL, off the N.E. end of the Sunk Sand, for the King's Channel, &c. One brilliant light, at 30 feet above the sea, may be seen at three leagues off. A red ball and gong as above. *Pages* 26, 27, 28.

HARWICH LIGHTHOUSES; *two*,—for Harwich Harbour, &c. The highest is of gray brick, 60 feet high above the level of high water; the lower is white, and 27 feet only. They exhibit *brilliant fixed lights*, and bear from each other N.W. by N. *Pages* 35, 36.

NAZE of ESSEX.—A tower on the Naze, the top of which is 138 feet above the level of high water, and Walton Hall, are two conspicuous objects on this coast, as shown in page 26.

SHIPWASH.—At the N.E. end of the Shipwash, a *light-vessel*, similar to that of the Swin Middle, above-mentioned, was first stationed here, in 4½ fathoms, in January, 1837. *Page* 29.

GALLOPER LIGHT-VESSEL,—near the South end of the Galloper, for avoiding that sand, the Kentish Knock, &c.; exhibits two brilliant lights at 32 feet above the level of the sea, which may be seen at ten miles off. A gong in thick weather, every ten minutes. *Page* 39.

KENTISH KNOCK; a buoy, striped black and white, from the nozzle to the head, a white circle upon the head, and a black centre, with the words Kentish Knock, in white letters, upon it, carrying a beacon or staff, as shown in page 40. In 1829 a *watch buoy*, black, with the head thereof half white, was laid down in 5 fathoms, at about a cable's length S.W. by S. from the beacon-buoy.

NORTH-FORELAND LIGHTHOUSE,—on the North Foreland, for coming in from sea, between Margate Roads and the Gull Stream, &c.; a *white* tower of the first class, of which the lantern is 340 feet above the level of high water: the light, *brilliant and fixed*, may be seen six or seven leagues off. *Page* 41.

This tower, a strong octagon of flint, was originally built for a coal-fire, in 1683; but was modernized and greatly improved in 1790. The height of the building, from the lantern to the base, is 50 feet. See, further, our *Directory for the English Channel.*

GOODWIN LIGHT-VESSEL, off the North Sand Head of the Goodwin, for coming in toward the Downs, &c. This vessel exhibits *three brilliant lights* on separate masts, at 35 and 23 feet above the level of the sea; the main-mast being the highest. A red ball by day and gong for foggy weather. *Page* 41.

ORFORDNESS LIGHTHOUSES, two, for the Inner Channel to Orfordness, and clearing Aldboro' Knapes, &c. bear, when in a line, N.E. by E. ½ E. and S.W. by W. ½ W. They are built of stone, and are, respectively, 83 and 55 feet in height from the base. The lights are brilliant, fixed, and may be seen more than seven leagues off. *Pages* 32, 33, 40.

PAKEFIELD.—A lighthouse established in 1832, at three miles to the south-westward of Lowestoff South-ness. The structure is white, and exhibits a light coloured *red*, which distinguishes it from the other lights on shore. The light is 68 feet above the level of the sea, and may be seen more than 4 leagues off. *Pages* 42, 48.

"During certain states of the atmosphere, a *faint* light, from Pakefield lighthouse, may be seen at both the South Newcome and Barnard Buoys; and as the lighthouse bears from the Barnerd Buoy N. by W. ½ W., and from the South Newcome Buoy W. by N., the commanders of vessels are recommended, when working between these buoys, to *tack short* at those bearings. Vessels navigating with a fair wind should keep the light bearing N.W." *Page* 45.

LOWESTOFF.—Two Lighthouses, as a guide toward Lowestoff Roads, &c. They stand within Lowestoff Ness, and in a line bear N. ¾ E. at half a mile asunder, and exhibit brilliant fixed lights. The lights in one formerly led to the *Passage*, but now to the *Bar*, of the Stanford. *Page* 42.

STANFORD LIGHT-VESSEL, between the CORTON SAND and LOWESTOFF INNER

Shoal, and off the N.E. end of the Newcome, in 2¼ fathoms. It exhibits two brilliant lights, placed horizontally, at 23 feet above the sea, and which may be seen at three leagues off. A red ball by day, and gong for thick weather, &c. *Pages* 44, 45.

ST. NICHOLAS Light-vessel, within St. Nicholas Gat, with a brilliant light, at 36 feet above the water, similar to those of the Swin Middle and Shipwash, above described. *Page* 46.

NELSON'S MONUMENT at Yarmouth, with the church, &c., are excellent day-marks for Yarmouth Roads. A figure of the monument, standing on the Denes, is given on our chart of the Eastern coast, and it is noticed in the Directions hereafter, page 48.

WINTERTON LIGHTHOUSE, in Norfolk; a stone tower, on crown-lease, built in 1790. It stands on Winterton Point, is 52 feet in height, and exhibits a brilliant fixed light, which may be seen nearly twenty miles off. Its appearance, with the objects near it, is given on the chart of the East Coast, from the drawing of Captain Huddart.

NEWARP LIGHT-VESSEL, at the entrance of Hasboro' Gat.—This vessel, which formerly exhibited two lights only, now shows *three brilliant lights*, upon separate masts, of which the central is the highest; and it is thus distinguished from a new light-vessel off the northern part of Hasbro' Sand, which shows *two* lights. The main-mast is 37, and the other masts 22, feet high above the level of the sea. The lights may be seen at three leagues off. For the words *Hasbro' Gat*, formerly on the vessel, the name *Newarp* has been substituted. *Page* 49.

HASBOROUGH LIGHTHOUSES, for sailing in and out of Hasborough Gat.—Two towers, at half a mile from each other, of a red colour, the lanterns, respectively, 100 and 137 feet above the level of high water. The buildings from the base to the lantern, are 63 and 77 feet in height. They exhibit brilliant fixed lights, which may be seen at 15 and 17 miles off. As a leading mark for Hasboro' Gat, they bear, in a line, nearly N.W. *Page* 51.

HASBOROUGH SAND, Floating Light.—Notice was given, dated Trinity-House, London, 6th of January, 1832, that the corporation had caused a *floating light-vessel* to be moored off the *north end of Hasborough Sand;* the lights on board which were first exhibited on the evening of the first of January, 1832. These lights are exhibited from two lanterns, raised on separate masts, 37 feet high; and the vessel is moored in 13½ fathoms, as shown in page 50. The lights may be seen at three leagues off.

CROMER or FOULNESS.—A lighthouse of stone, represented in page 52. The height of the lantern is 274 feet above the sea at high water. It exhibits a brilliant light, which revolves, and shows a face every minute. In clear weather the light may be seen more than seven leagues off.

LYNN WELL, Floating Light.—Moored in 22 fathoms, off the Hook of the Long Sand. It exhibits *two brilliant lights*, at 32 feet above the level of the sea, and has a red ball, gong, &c. as the other Trinity lights. The lights may be seen ten miles off. *Page* 60.

CHAPEL LIGHT, on Hunstanton Point.—An old lighthouse, coloured white, with a bright fixed light, at 85 feet above the sea. The height of the building is 30 feet. Seen at more than three leagues off. *Page* 60.

LYNN and WISBEACH, Harbour Lights.—The lights shown at the pilot-house, in the lower part of the town of Lynn, are of gas, and lighted only in dark nights or mornings in winter, to lead vessels, when they are in one, clear of the high part of the Vinegar Middle, &c. but they are useful to pilots only.

For the Wisbeach Channel there are two tide-lights, one on each jetty-head, at the entrance of the New Cut, useful to pilots for making the entrance. These are lighted when there is sufficient water for admitting vessels, which may be lying in *Crab's Hole*, ready to enter. *Page* 62.

DUDGEON LIGHT-VESSEL, upon the western side of the Dudgeon Bank, in 8 fathoms; exhibits one brilliant light, at 33 feet above the sea, which may be seen at 10 miles off: a red ball, gong, &c. *Page* 56.

SPURN LIGHT-VESSEL, for showing the proximity of the New Sand, &c.—Moored in 8 fathoms, at 3¾ miles S.E. by E. from the Spurn lighthouse; exhibits *one brilliant light*, which may be seen at three leagues off. A red flag, gong, &c. *Page* 66.

SPURN POINT LIGHTHOUSE.—A dark brick structure, 90 feet high; lantern 100 feet above high water; exhibits a fixed light, which may be seen at five leagues off: but, on the sector between N.W. by W. and N.N.W. ½ W. (comprehending the New Shoal or *Chequer Sand*) the light appears of a red colour. On the last bearing the red light disappears, and the brilliant is again in sight.

The proprietors of the lights on the Spurn Point gave notice, in January, 1830, that the continued and rapid encroachments of the sea had rendered it impracticable to continue the exhibition of the light in the low or south-easternmost lighthouse on the point, as formerly, and that arrangements had been made for the exhibition of a temporary light, in the same line of bearing from the high light, (N.W. ½ N.) until the necessary measures can be taken for the exhibition of a light of a more permanent description.

RIVER HUMBER.—The corporation of Trinity-House, of Kingston upon Hull, gave notice, in November, 1830, that they should place a light-vessel near the *Bull Sand*, which vessel was first lighted on the 1st of January, 1833. The light is brilliant, in a single lantern, raised on a mast. The vessel is moored in 4½ fathoms, at about one mile and a half from the Spurn Point, with the high light bearing N.E. ½ E. as shown in the directions. During the day the vessel displays a *blue* flag, and a gong is sounded in hazy and dark weather. *Page* 66.

Under the orders of the same Corporation a *Beacon*, painted red and 50 feet high, has been erected on *Donna Hook*: and another, painted black, 60 feet high, on *Clea Common*, for the use of vessels entering the Humber, as shown in page 67.

KILLINGHOLME and PAULL.—In 1836, the Corporation of Trinity-House in Hull established lighthouses at Killingholme and Paull, on the Banks of the Humber. Two lighthouses now stand at South Killingholme, and one at Paull, 3½ miles higher up, on the opposite side. All exhibit brilliant fixed lights.

These lights are more particularly described in the directions hereafter, page 67. When those of Killingholme are in one they bear N.W. ¼ N., and will lead ships and vessels, coming from sea, in a clear course up the river from the Spurn. On approaching them, the light at Paull will be seen, when vessels alter their course to the northward, but do not steer for it until the high light at Killingholme bears W.S.W.

FLAMBOROUGH HEAD LIGHTHOUSE.—A white tower, 72 feet in height; its lantern elevated 214 feet above the level of high water. The lights *revolve*, and have three faces, of seven reflectors each, of which one appears full in every two minutes. One of the faces is coloured *red*, and the light from that face is, consequently, not visible so far or so strongly as the others; and when, in hazy weather, or at great distances, only two faces are seen, the interval of time between them will be two minutes and four minutes alternately. In clear weather the brilliant lights may be seen from a distance of six leagues. *Page* 72.

SCARBOROUGH.—A *tide light*, upon a white tower on Vincent's Pier-head'; to be left on the starboard side when entering the harbour. It is *red*, and may be seen at nine miles off. Its height is 41 feet above the level of high water, and the light is kept on while there are 12 feet of water in the harbour. By day a *blue* flag is hoisted for the same period. *Page* 72.

WHITBY.—A stone lighthouse, on the western pier-head, exhibits a *brilliant fixed light*, at 83 feet above the sea, which is kept on two hours before and after high water. The height of the tower, from the base to the lantern, is 60 feet, and the light may be seen four leagues off. In the day a flag is hoisted on the western cliff, during the same period of tide, or while there are, upon the bar, 8 feet of water. *Page* 75.

HARTLEPOOL.—A lighthouse, with harbour-light, of a red colour, on the pier-head. Vessels from the northward open it when it bears W.N.W. Immediately below the red light is a brilliant tide-light, kept in from half flood to half ebb. Two other lights, *red*, serve as a guide into the harbour. In the day time a red flag is hoisted at half flood, and continued until half-ebb. *Page* 78.

SUNDERLAND.—*Two lighthouses*, one on each pier; the northern is 64 feet in height, the southern 23 feet, and the lanterns are 73 and 32 feet above the level of high water. The lights are brilliant and fixed, and seen at from three to six leagues off. The northern light is kept up during the night; but the southern from half flood to a quarter ebb only, or while the wind and tide are favorable for entering the harbour; and, with a westerly wind, it is put out at high water. By day a flag is hoisted during the same period of tide. *Page* 79.

In December, 1837, the Commissioners gave notice that, from the 1st February, 1838, there would be exhibited from the lighthouse on the north pier, in addition to the stationary light, another light, coloured *red*, 18 feet lower, and both exhibited through the night, as usual.

NORTH SHIELDS. — *Two lighthouses*, white; the highest in front of Dockwray Square, the lower near Clifford's Fort, and bearing from each other W. ½ N. and E. ½ S., 720 feet. The lights are *brilliant* and fixed, at 133 and 77 feet, respectively, above the level of high water. The upper tower is 49, and the lower 76, feet in height. The lights appear only from one-quarter flood to one-quarter ebb, and a flag is hoisted in the day during the same period of tide. The lights, which form a leading direction for entering the river, may be seen from 5 to 6 leagues off. *Page* 80.

TYNEMOUTH CASTLE.—A tower of stone, in the Castle yard, 62 feet high, with its lantern 148 feet above the level of the sea. Its light is *brilliant and revolving*; in full lustre once a minute, and may be seen at six leagues off. *Page* 79.

BLYTHE.—Two *harbour lights* on the larboard side, when entering the harbour, while there is a depth of 8 feet of water upon the bar. They bear, when in a line, N.N.W., and may be seen at five or six miles off. A flag by day, as usual. *Page* 80.

FARN ISLANDS.—There are three lighthouses on the Farn Islands. One of them is on the *Longstone*, an islet of the north-eastern cluster, and two on the *Farn* or principal isle.

The lighthouse on the Longstone is of stone, 71 feet in height from the base to the lantern. The last is 75 feet above the level of high water. Its light is brilliant, it revolves, and shows the full face of a reflector once in half a minute, and may be seen, at four leagues off. The high light on Farn Island bears from this light W.S.W., distant 2⅜ miles. *Pages* 85, 95.

The High Light on Farn Island is also of stone, and the light revolves, similar to that on the Longstone, at 80 feet above the sea, and may be seen at more than four leagues off. The *Lower Light*, on the same island, bears from it N. by W., 560 feet. Its light, *brilliant and fixed*, is only 40 feet above the level of high water, and may be seen three leagues off, from near the direction of S. by E. only. *Pages* 83, 95.

BERWICK.—A stone tower, 55 feet high, on the pier-head, exhibits two lights. Of these, the upper one is brilliant, 44 feet above the sea at high water, and lighted all night. It may be seen at four leagues off. The lower light, elevated 24 feet, is of a bright red colour, and shown only while there are 10 feet of water upon the bar. The first is seen from all points between N. by W. ¾ W. seaward to S.W. ¼ S.: the second (*red*) from E.N.E. ½ E. to S.S.W. *Pages* 88, 93.

COAST OF SCOTLAND.

*** *The distances at which the Lights and Beacons of Scotland can be seen are calculated on the supposition that the observer's eye is* 15 *feet above the level of the sea, at high water of ordinary spring tides.*

ISLE OF MAY LIGHTHOUSE, on the highest part of the isle; built of stone, as shown in the figure, page 102, hereafter. The building, from the base to the lantern, is 57 feet in height, but the elevation of the latter, above the sea at high water, is 240 feet. The light is *brilliant and fixed*, and may be seen from all points, at the distance of seven leagues.

INCH KEITH LIGHTHOUSE, on the highest part of Inch Keith, built of stone, as shown in the figure, page 102. The building is only 45 feet in height, but the elevation of the lantern, above the sea, is 220 feet. It has a brilliant light *apparently* revolving, which appears refulgent, or in its greatest lustre, once a minute, and may be seen from all points, six leagues off. *Page* 102.

LEITH.—Two lights on the eastern pier, at 1500 feet S. ½ W. and N. ½ E. from each other. The old one, *brilliant*, is 10 feet above the sea at high water. The new one, *red*, has, from December, 1829, been exhibited on the extreme point of the pier. Masters and pilots entering the harbour will keep the red light its own breadth or diameter open to the eastward or left of the Old Pier light, when they will be in mid-channel and close to the present white or fair-way buoy.

The lights are kept up while there are nine feet of water on the bar. In the day-time signals are displayed, in relation to the rise of the tide, commencing with one ball at the top of the flagstaff when there is a depth of nine feet on the bar. *Page* 104.

NEWHAVEN, near Leith.—A small fixed light, of a *red* colour, is exhibited on the pier, but only when the passage-boats ply in the night. It may be seen between two and three miles off. *Page* 104.

QUEENSFERRY, above Inch Garvy. A bright fixed light at *New Halls*, near South Queen's Ferry, and another at the principal slips or piers of the North Ferry; for the use of the ferry-boats in *dark* nights; clear moon-light nights being excepted. *Note, page* 107.

BURNT ISLAND.—A small bright light, at 20 feet above the level of high water, is kept up during the night on the eastern or starboard side when entering the harbour. Seen at the distance of six or seven miles. *Page* 104.

KINGHORN.—A lighthouse on the eastern pier, exhibits a bright light, at 20 feet above high water, but it is kept in only while there is eight feet of water in the harbour. Seen at six or seven miles off. *Page* 104.

FIFENESS.—Beacon on the Outer Carr Rock, erected in 1822, and surmounted by an iron ball, 3½ feet in diameter, and about 26 feet above the mean level of the sea, or 30 feet above low water. *Page* 108.

BELL ROCK LIGHTHOUSE.—This noble structure, erected by Mr. Stevenson, is described hereafter. The light revolves, and appears, alternately, *red* and *brilliant*, at intervals of two minutes. The height of the lantern above the sea, at high water, is 90 feet. The brilliant light may be seen at five leagues, and the red light at four leagues off. A bell, in thick weather, is sounded or tolled at intervals of half a minute. *Pages* 109, 110.

BUTTON-NESS, at the Mouth of the Tay.—Two white towers on Button-ness are surmounted by the leading lights for passing over the bar of the Tay. They are, respectively, 70 and 50 feet in height, and the lanterns are at 85 and 65 feet above high water. The distance between them is 1122 feet, and they bear, when in a line, N.N.W. ½ W. The lights are *brilliant* and *fixed*, and may be seen from three to four leagues off. *Page* 112.

RIVER TAY; South Ferry.—Two leading lights for the fair-way, between the Abertay Bank and Button-ness; 1321 feet from each other, and bearing, when in one, N.W. by W. ¾ W. The towers are white, the lights brilliant, and may be seen from three to six miles off, the lanterns being respectively at 65 and 45 feet above high water. *Page* 112.

DUNDEE HARBOUR.—Two light-towers on the eastern and middle piers, bearing, when in one, N.W. ¼ W., and leading to the southward of the Beacon Rock. They are only 10 and 12 feet above high water, and seen three or four miles off. In entering the wet-docks one light is left on the starboard, and the other light on the larboard, hand. See further, page 112.

DUNDEE FERRY.—Three lights for the guidance of the ferry-boats: one being on the Craig-pier of Dundee, the others at Newport on the south shore. The latter in one, bearing S.S.W. lead clear of the east end of the Middle Bank. *Page* 112.

ARBROTH.—A small fixed light of a *red* colour, on the northern pier-head; lighted by the pilots only when vessels appearing in the bay may enter into the harbour. Seen at two or three miles off. *Page* 112.

MONTROSE.—Two light-towers, *white*, on the northern side of the entrance, bearing, when in one, N.W. by W. ¾ W. The lights are fixed, of a bright red colour, respectively at 45 and 35 feet above high water, may be seen at six or seven miles off, and lead clear of the *Annet*, as shown in page 113.

GIRDLENESS Lighthouse, near Aberdeen.—On Girdleness is a lighthouse, which was first lighted on the 15th of October, 1833. It is situate in latitude 57° 8′, and longitude 2° 3′ W. Immediately off it lies the sunken rock called the *Girdle*.

The tower exhibits two brilliant fixed lights, vertically, and appearing within a certain distance distinctly like stars of the first magnitude; but beyond that distance the two lights appear as one, having an elongated form. The lanterns are elevated respectively at 115 and 185 feet above the mean level of the sea, and the lights are seen, in clear weather, at 13 and 16 miles off. *Page* 114.

ABERDEEN.—A light on the head of the north pier, of a *red* colour, and a flag by day, when there is a depth of nine feet over the bar. *(Proposed to be improved.) Page* 115.

BUCHAN-NESS.—A lighthouse of stone, 100 feet in height, with its lantern 130 feet above the level of the sea. It exhibits a *brilliant flashing light*, seen in its refulgence every five seconds, as shown in page 115, hereafter, and which may be seen at 16 miles off.

KINNAIRD'S HEAD.—Lighthouse of stone, 57 feet in height, with its lantern 120 feet above high water of spring tides. It exhibits a brilliant fixed light, seen at five leagues off, from all points between W.N.W. northerly to S.E. *Note, page* 118.

TARBET-NESS, near the Frith of Moray or Murray.—A light-tower, first lighted on the 20th of January, 1830. Its lantern is open or glazed seaward from S.W. ½ W. to W. ½ N., and is elevated 175 feet above the mean level of the sea. The light, in clear weather, will be seen at the distance of 6 leagues, and at lesser distances according to the state of the atmosphere.

The light is intermittent: suddenly appearing like a star of the first magnitude, and continuing in view 2½ minutes, when it suddenly becomes eclipsed for half a minute; thus producing its characteristic effect once in every three minutes.

But, within the Moray Frith, in a south-westerly direction from Tarbet-ness, where the light cannot be mistaken for any other on the coast, it is *permanently* visible, until the mariner pass within a line between Tarbetness and a point half a mile seaward of the King's Sons, when it will be intercepted from his view by the high land of the coast. The interception of the light by the land will thus form a direction for avoiding these dangerous rocks. *Page* 120.

PENTLAND SKERRY LIGHTS.—Two stone towers, exhibiting *brilliant fixed lights*; they are 60 feet asunder, bearing from each other N.N.E. and S.S.W. respectively at 140 and 170 feet above high water of spring-tides, and seen from all points, from 16 to 18 miles off. *Pages* 121, 123.

DUNNET HEAD Lighthouse.—A tower of stone, 45 feet high, situated on the northern extremity of the main land of Scotland; first lighted on the 1st of October, 1831. The light is *stationary or fixed*; and, being elevated 346 feet above the mean level of the sea, it will be seen like a star of the first magnitude, at the distance of 7 leagues, and at intermediate distances, according to the state of the weather. *Page* 120.

CAPE WRATH or RATH, the N.W. point or headland of Scotland. A light-tower of the first class, of which the lantern or light-room is elevated 400 feet above the level of the sea.

The light is *revolving*, exhibiting from one and the same lantern a light of the natural appearance, alternating or changing with one tinged *red*; which two kinds of light successively attain their most luminous effect every two minutes, and thereafter becoming gradually less luminous, are to a distant observer totally eclipsed for a short time.

The brilliant light will, in clear weather, be seen like a star of the first magnitude at the distance of 8 or 9 leagues, and at lesser distances according to the state of the atmosphere; but the *red* light, being somewhat obscured by the coloured shades, will not be seen at so great a distance. *Page* 121.

ORKNEY.—Lighthouse on the Start Point of Sanda.—A stone tower 80 feet in height; its lantern, 100 feet above high water, exhibits a brilliant revolving light, which appears refulgent once in a minute, and may be seen at five leagues off. *Page* 125.

North Ronaldsha.—Prior to the erection of the Start Point Lighthouse, in 1806, a light was exhibited on Dennis-ness, the N.E. point of North Ronaldsha, seven miles to the northward of Start Point. The light was discontinued when that of the Start commenced, but the tower of masonry is left, and now appears as a beacon of stone, surmounted by a ball of masonry, eight feet in diameter. Its top is 70 feet above high water of spring-tides, and may be seen 13 miles off.

SHETLAND.—Lighthouse on Sumbro' Head, the S.E. point of the Main land of Shetland. A tower of stone, 35 feet in height, but the lantern of which is 300 feet above the level of high water. The light is brilliant and fixed, and, when not obscured by clouds or mist, may be seen at 22 miles off. *Page* 127.

COASTS OF FRANCE, BELGIUM, NETHERLANDS, &c.

CAPE GRISNEZ.—A new Light-tower, of the first order, from the 1st of November, 1837, exhibits a brilliant and *fixed* light, at 198 feet above the level of the sea at high water, which in clear weather may be seen at seven leagues off. Great caution is required in not mistaking this light for that of Dungeness, on the opposite coast, as noticed in page 138.

CALAIS HIGH LIGHT, of the first order, *brilliant and revolving*, appearing full for about thirty seconds, and disappearing nearly a minute. May be seen about seven leagues off, the elevation being 124 feet. A *tide light* upon *Fort Rouge*, on the western side of the entrance, is kept up while there is 10 feet of water on the bar, and is seen at 4½ miles. A flag by day, and a bell for foggy weather, *Pages* 139, 145.

DUNKIRK.—*A brilliant fixed light*, on the tower of the *Heuguenard*, at 82 feet above the level of the sea, seen at five leagues off; and a harbour-light on the head of the western jetty, 32 feet high, seen at a league and a half. *Page* 140.

NIEUPORT.—A tide-light, for the use of the coasters, established in 1825, and lighted only during the time that such vessels may pass the Bar. *Pages* 141, 147.

Official notice, dated 12th May, 1825.—"From the 15th of April, a fire or a light has been lighted in the harbour of Nieuport, which points out at each tide, when there are 3 yards 8 palms (or 14 Flemish feet) of water on the Bar before the harbour, and which is extinguished when the tide is as low as 4 yards 4 palmes, or 16 feet.

This light can be perceived at a distance of five miles, on coming from the west in the direction of S.S.E., and on coming from the east, in the direction of S.S.W. at 4 miles. In entering the port, the light must be brought to S. 18° E.

OSTEND.—A light-tower, at the N.E. angle of the town, represented in page 141, and exhibiting a *fixed light*, which may be seen at three leagues off. At tide-time flags are hoisted on shore as follow: a small blue flag when there are 14 feet of water on the bar; a large blue flag when 17 feet; and a red flag when 24 feet. Page 148. Two lights are exhibited by night on the eastern jetty-head, at the time of high water, which, in a line, lead over the Bar. *Page* 149.

BLANKENBERG.—A fire beacon, occasionally lighted for the use of the fishers. *Page* 149.

WEST CAPPEL.—A light-tower on the church, with a brilliant fixed light of 32 lamps and 8 reflectors. Seen between four and five leagues off. *Page* 150.

FLUSHING and TER VEERE on Walcheren, and ZIERIKSEE on Schowen, have harbour-lights useful to the pilots, but of which we possess no particular description. *Pages* 150, 153.

SCHOWEN.—On the western extremity of this island are two lighthouses, as leading marks for the *New Deep*, and bearing, when in one, S.S.E. One stands on the easternmost part of a high sand-hill, and the other is near the shore. *Pages* 151, 159.

GOEREE and HELLEVOETSLUYS, the ports of.—Common harbour lights. *Page* 151.

OOST-VOORN, at the MOUTH of the MAES, and BRIELLE on Voorn Island. Harbour lights, which, when brought in one, lead into the South Channel of the River. *Page* 151.

HOOK of HOLLAND.—A tide-light, to denote when there is sufficient depth for vessels crossing the Bar. *Page* 151.

LIGHT-BEACONS, &c.—Here it may be proper to notice, with respect to the lights on the Coast of Holland, as exhibited on the charts, that they are not in general regular lighthouses, kept constantly lighted, but that some are merely temporary lights, on beacons, erected for the use of fishermen off the coast. Too much dependence on seeing them should not, therefore, be made.

SCHEVELING, KATWYK OP ZEE, and NORDWYK OP ZEE.—Light-beacons for the temporary use of the Fishery. *Pages* 167, 168.

ZANDVOORT, and WYK OP ZEE.—Light-beacons. *Page* 168.

EGMOND OP ZEE.—Two towers, in the direction of S.S.E. ½ E. and N.N.W. ½ W. with bright and fixed reflecting lights. The northernmost is 27½ and the southernmost 28½ yards above the ordinary level of the sea. *Page* 168.

KYKDUIN or KYKDOWN, near the Helder.—A Light-house on the summit, erected in 1822, exhibits a strong fixed light, at about 55 feet above the level of the sea. *Page* 186.

VLIELAND.—On the N.E. part are several beacons and a light-house, at the entrance of the Vlie Stream. The lighthouse exhibits a brilliant fixed light, which may be seen nearly four leagues off. *Page* 176.

TERSCHELLING.—On the western part, a conspicuous tower, *Brandaris*, with two beacons and two harbour-lights. *Page* 176.

ROTTUM, at the Mouth of the EMS.—On this, the last island belonging to the Netherlands, are two high beacons of wood, serving as a thwart-mark for the mouth of the Western Ems. One is maintained by the Dutch, and the other by the Hanoverian, government. They are useful as marks for finding the buoys at the mouth of the different channels, particularly to those approaching from the N.W. *Page* 178.

BORKUM.—Since the year 1817, a tower, near the middle of this isle, has exhibited a fixed light, consisting of 27 lamps, inclosed in a lantern 14 feet in diameter, at 150 feet above the sea. Nine of these lamps are turned toward the land, and the other eighteen toward the sea. The light is kept up through the night from sun-set to sun-rise, and may be seen more than six leagues off. *Page* 178.

WANGER-OOG, near the mouth of the JAHDE.—A new light-house on Wanger-oog was first lighted on the 1st of November, 1830. It is built of bricks, in form of a column, and supports a lantern, in which, at 67 Hamburg feet above common high water mark, an *intermitting light* is exhibited, which is alternately visible and invisible for the space of one minute, and is thus distinguished from the neighbouring lights at Borkum, Heligoland, Neuwerk, and Cuxhaven, all of which are fixed lights. *Page* 181.

From the high tower with three pinnacles, which is situated on the western part of the island of Wanger-oog, and discernible as a day signal, from a considerable distance at sea, the new lighthouse stands E. ¼ N. or N. 88° E. by compass, distance 1750 feet.

RIVER WESER.—A FLOATING LIGHT within the entrance, between the *Mellum* and *Tegler's Plat*, having two masts, and displaying in the day-time, a white flag, with a red cross on it, at the main topmast head, and in the night a lantern light, at 28 feet above the deck. The light is seen at three miles off. *Page* 182.

HEILIGOLAND.—*(British.)* A light-tower, of which the lantern exhibits a modern fixed light, at 250 feet above the level of the sea. Seen at six leagues off. *Pages* 175, 180, 183.

RIVER ELBE.—The first signal-ship, at the mouth of the river, exhibits on the main-mast a *red flag* by day, and a lantern-light by night, at 38 feet above the deck. In thick weather a bell is sounded once in a minute.

A *second vessel*, in the entrance, is the *pilot-vessel*, which resembles the above, and has her station, in fair weather, by the red buoy; and in bad weather, at the Flügel-ton, near Neuwerk, about three leagues within the first signal ship. She carries her flag upon the flag-staff from the taffarel. *Page* 185.

NEUWERK ISLAND and CUXHAVEN.—Light-houses, with fixed lights, the figures of which are represented on page 185. The high light, being elevated 120 feet above the sea, may be seen at more than four leagues off. The lower light, 60 feet above the water, at more than three leagues.

RIVER EYDER.—A floating light, two beacons, and buoys, as shown on the charts. The light-vessel has two masts; her sides are painted *red*, with a white streak; and she is to be found on her station from February to November. By day a small Danish flag is displayed at 60 feet above water, and by night a lamp at 34 feet. See further, *page* 190.

AMRUM BEACON.—This beacon, 60 feet in height, stands, at 4 miles to the southward of the island Amrum, about half way between the south end of Sylt and the mouth of the River Hever. It serves to denote the vicinity of the extensive banks which exist here, and the mouths of the different rivers. *Page* 191.

SKAGEN or SKAW POINT.—A light-tower, with a fixed lamp light, on the Odde or Grenen of the Skaw, at 67 Danish feet above the sea. The tower is kept white, and it by day, as well as the light by night, may be seen between four and five leagues off. *Page* 192.

Signal Flag, denoting ice in the Cattegat, note, *page* 192.

COAST OF NORWAY.

MARK-OE, westward of the Naze.—On this elevated island a fire-light is exhibited, as shown in page 195, and, by those coming from the westward, it is seen before that of the Naze comes in sight.

LINDERSNŒS, or the Naze of Norway.—Two coal fires at a great height; one tower only, which is square, and always to be kept white, so as to be equally serviceable as a day mark. *Page* 195.

RYVINGEN and other Beacons.—The five beacons erected by order of the Danish Government, in 1825, are mentioned hereafter, in a note, page 196. Those of *Hellis-oe,* to the westward of Christiansand, are described in the text, same page: and to these we have now to add the important lights of the port of Christiansand, established in 1833.

CHRISTIANSAND.—On the islet called Ox-oe, at the entrance of the Harbour of Christiansand, a handsome round tower, *white,* now exhibits a *variable* light, at 135 Danish feet above the level of the sea. Strong flashes occur every four minutes, and may be distinguished at 20 miles off. In connexion with this light-house, a harbour-light is established on Odder-oe, at four miles to the north from Ox-oe, which is lighted and extinguished at the same time as that on Ox-oe; but the light is only 25 feet high above the surface of the sea. For further particulars, with the sailing directions, see *page* 197.

ANHOLDT in the Cattegat.—A new fixed lamp-light. See the note, in page 192.

POSITIONS OF PLACES IN THE NORTH SEA, &c.

ACCORDING TO THE GRAND TRIGONOMETRIC AND OTHER SURVEYS.

	Latitude.			Longitude.			
	°	′	″	°	′	″	
GREENWICH Royal Observatory	51	28	39	0	0	0	✱
Cathedral of St. Paul, London	51	30	49	0	5	47	W.
Tilbury Fort; flagstaff	51	27	9	0	22	37	E.
Sheerness; flagstaff	51	26	46	0	44	26	E.
Walton Tower, on the Naze	51	51	51	1	17	7	E.
Harwich Steeple	51	56	43	1	17	8	E.
Landguard Fort (cupola)	51	56	19	1	19	4	E.
Bawdsey church	52	0	39	1	24	52	E.
Hollesley church	52	2	49	1	25	38	E.
Orfordness high lighthouse	52	5	0	1	34	14	E.
Yarmouth church	52	36	40	1	43	30	E.
Lynn Old Tower	52	46	52	0	25	4	E.
Spurn lighthouse	53	34	44	0	7	15	E.
Flamboro' Head lighthouse	54	7	15	0	6	20	W.
Whitby	54	28	30	0	35	20	
Hartlepool steeple	54	41	49	1	10	31	
Easington steeple	54	47	9	1	21	1	
Sunderland; Lighthouse on the North pier	54	55	12	1	21	16	
Tynemouth lighthouse	55	1	21	1	24	31	
Coquet Island; tower	55	20	11	1	31	47	
Sunderland Point; windmill	55	34	45	1	37	56	
Summit of Cheviot-hills	55	28	52	2	8	12	
Farn Island high light	55	37	11	1	38	51	
Staples Island lighthouse	55	38	9	1	37	5	
Bamboro' castle; flagstaff	55	36	42	1	42	8	
Holy Island Castle; flagstaff	55	40	20	1	46	38	
Berwick-upon-Tweed; spire	55	46	21	1	59	41	
St. Abb's Head	55	55	30	2	7	50	
Bass-rock, or islet	56	4	53	2	37	47	
Inch Keith lighthouse	56	1	45	3	7	40	
Leith Signal Tower	55	58	50	3	9	50	
EDINBURGH; Calton-hill	55	57	30	3	10	30	
St. Monace; spire	56	12	24	2	45	37	
Pittenweem; spire	56	12	48	2	43	2	
East Anstruther; spire	56	13	40	2	41	24	
Kilrenny; spire	56	14	17	2	40	35	
Crail; spire	56	15	58	2	36	55	
Fifeness	56	17	0	2	34	40	
May Island lighthouse	56	11	22	2	32	47	
St. Andrew's church	56	20	30	2	47	10	
Bell-rock lighthouse	56	26	34	2	23	59	
Dundee	56	28	0	2	57	30	
Button-ness; High light	56	28	7	2	44	53	
Montrose; Round tower	56	45	5	2	26	6	
ABERDEEN; Observatory of the Marischal College	57	8	59	2	5	42	
Buchan-ness lighthouse	57	29	15	1	47	0	
Kinnaird's Head; Fraserburg lighthouse	57	41	50	2	0	6	
Duncansby Head	58	39	0	3	1	30	
Pentland-skerries; High lighthouse	58	41	38	2	55	0	
Fair Island; highest point	59	32	54	1	37	50	W.
Sumbro' Head lighthouse	59	51	20	1	16	27	W.
Balta Island; Highest point	60	45	3	0	47	17	W.
HELIGELAND, or Heligoland	54	11	20	7	53	0	E.
Texel Island; S.W. end	53	1	40	4	38	0	E.
Altona; the Observatory	53	32	45	9	56	39	E.
Naze of Norway (*by Danish Survey*)	57	57	50	7	3	15	E.
Skaw Point lighthouse	57	43	44	10	37	35	E.

A GENERAL TABLE
OF MAGNETIC BEARINGS,

With the DISTANCES, *from* DIFFERENT PLACES *on the Coasts of* BRITAIN *to* OTHER PLACES *on the* OPPOSITE COASTS.

		Compass Bearings.	*Nautic Miles.*
NORTH FORELAND to	The Galloper light vessel	N.E. by E. ¾ E.	31
	Calais	S. ¾ E.	29
	Dunkirk	S.E. ¾ S.	40
	Ostende	S.E. by E. ¼ E.	57
	West Cappel	E.S.E. ½ E.	75
	Goeree Gat (entrance)	E. ½ S.	93
	South entrance of the Texel	E.N.E. ¾ E.	151
ORFORD-NESS to	Dunkirk	South	68
	Ostende	S. by E. ¾ E.	70
	West Cappel	S.E. ½ S.	74
	Goeree Gatway	S.E. ¾ E.	86
	The south entrance of the Texel	East	124
	The Naze of Norway	N.E. ½ E.	398
LOWESTOFFE to	Dunkirk	S. ¾ W.	89
	Ostende	S. ½ E.	86
	West Cappel	S.S.E.	85
	Goeree Gatway	S.E. ¾ S.	87
	The south entrance of the Texel	E. by S.	107
	Heiligeland, or Heligoland	East.	240
	Bovenbergen	N.E. by E. ¾ E.	328
	The Naze of Norway	N.E. by E.	376
	Skuddesnœs-light, Norway	N.E. ¼ N.	417
ENTRANCE of the HUMBER to	The south entrance of the Texel	S.E. ½ E.	165
	Heiligeland, or Heligoland	E.S.E. ½ E.	275
	Bovenbergen	E. by N.	327
	The Naze of Norway	N.E. by E. ¾ E.	348
FLAMBOROUGH HEAD to	The south entrance of the Texel	S.E. ¼ S.	181
	Heiligeland, or Heligoland	E.S.E.	280
	Bovenbergen	E. ½ N,	316
	The Naze of Norway	E.N.E. ¼ E.	334
	Skuddesnœs-light, Norway	N.E. by E.	350
TYNEMOUTH, or TINMOUTH, to	The south entrance of the Texel	S.E. ¾ S.	242
	Heiligeland, or Heligoland	S.E. by E.	326
	Bovenbergen	E. ½ S.	332
	The Naze of Norway	E. ½ N.	334
BERWICK ON TWEED to	Heiligeland, or Heligoland	S.E. ½ E.	355
	Bovenbergen	E.S.E. ¼ E.	336
	The Naze of Norway	E. ¼ S.	325
ISLE of MAY to	Heiligeland, or Heligoland	S.E.	380
	The Naze of Norway	E. ½ S.	333
	Skuddesnœs-light	E. ¼ N.	320
BELL ROCK to	Buchan-ness	N.E. ¼ N.	67
	St. Abb's Head	S. by W.	32½
	Heiligeland, or Heligoland	S.E.	378
	South entrance of the Texel	S.S.E.	318
BUCHAN-NESS to	The entrance of the Texel	S. by E. ¼ E.	349
	Heiligeland	S.E. by S.	383
	The Naze of Norway	E.S.E. ¼ E.	284
HANGCLIFF, SHETLAND to	Heiligeland	S. by E. ½ E.	474
	The Naze of Norway	S.E. ¾ S.	283
	Skuddesnœs-light	S.E. ¼ E.	201
SUMBRO' HEAD to	Fair Island	S.W. by W. ¼ W.	21
	Kinnaird's Head	S.W. ¾ S.	128
	The Naze of Norway	S.E. ¼ S.	285

THE NORTH SEA, &c.

⁂ THE BEARINGS AND COURSES THROUGHOUT ARE THOSE BY COMPASS, UNLESS WHERE OTHERWISE EXPRESSED; THE DEPTHS THOSE AT LOW WATER, SPRING-TIDES; AND THE MILES GEOGRAPHIC, OF 60 TO A DEGREE.

The VARIATION of the NEEDLE in the NORTH SEA is, at present, nearly as follows:—In the Thames' Mouth, and at Lowestoff, 24° W.; at Holy Island and Berwick, 26°; in the Frith of Forth, 28½°; at Shetland, 29°; at Calais, 23°; Ostende, 22°; Texel, 21°; Channel of the Elbe, 20°; Skaw Point, 19°.

SECTION I.

The RIVER THAMES, *from* LONDON BRIDGE *to the* NORE AND MEDWAY.

THE Corporation of the City of London, and that of the Trinity-House, are the guardian corporations of the River Thames. To the first appertains the jurisdiction for the conservancy of the river, its fisheries, &c.; and to the latter is confided the appointment and control of pilots, the erection of marks, regulation of ballastage, &c. &c.

In consequence of the right of jurisdiction, the legislature have placed the shipping of the port of London under the direction of harbour-masters, appointed by the corporation of London, and approved by the Trinity-House. The dock-masters of the London, West-India, and other Docks, appointed by the directors, with the approbation of the Trinity-House, are also empowered to direct the mooring, &c. of all vessels within 200 yards of the entrance of the docks, &c., which they may enforce under the penalties prescribed in the respective acts of parliament relative to these establishments.

The soil of the river, between London Bridge and the main sea, is vested in the Trinity-House, for the benefit of poor and decayed seamen, their wives, widows, or orphans; and for every ton of ballast raised or supplied from the bed or channel, for a merchant-vessel, without its authority, the corporation may levy the penalty of ten pounds.

In our "Piloting Directory for the different Channels of the Thames and Medway," lately published, is included a summary of the Bye-laws and Regulations of the Port of London; but as, from the 1st of March, 1837, certain alterations have been made, it becomes requisite to make such changes generally known; so far, at least, as they affect the shipping in the port.

In the first instance, it becomes the duty of the Harbour-masters, of which there are four, (appointed by the corporation,) to enforce the due observance of the Bye-laws and Regulations. The principal or superintending harbour-master has the sole and entire control of the executive part of the harbour and mooring chain service, and is responsible for the due performance of the whole of such service: he, therefore, gives to the other harbour-masters such orders and directions as he may deem necessary thereto.

The three harbour-masters, other than the principal harbour-master, are required to discharge the duties, and reside within the limits of particular stations; of which stations, the *first* or *upper one* extends from London Bridge to Wapping Dock Stairs; the *second* or *central station* extends from Wapping Dock Stairs to Limehouse Stairs; and the *third* or *lower station* extends from Limehouse Stairs to Bugsby's Hole: but these harbour-masters are required to assist, in the discharge of the duties of the service, in other parts of the river than their respective stations, when called upon by the principal harbour-master or the committee of the corporation.

Each of the harbour-masters is provided with a boat, and every requisite for the use thereof, with a competent number of watermen to row and navigate the same. The boat of the principal harbour-master is to be distinguished, at all times when on duty, by a small flag, with the merchant's *Union Jack;* the boat of the harbour-master of the upper station by a *red flag;* that of the harbour-master of the central station by a *blue flag;* and that of the lower station by a *white flag.*

Neither the harbour-masters, nor any person employed under them, are allowed to accept any gratuity, directly or indirectly, for any thing done, or omitted to be done, in the discharge of their respective duties: and no favor nor partiality is to be shown in the mooring, unmooring, moving, removing, anchoring, lying, or placing of any ship, vessel, steam-boat, lighter, barge, or other boat, or craft; or in any other matter regarding their respective duties; but shall direct the mooring or anchoring thereof in such manner as her size, draught of water, the trade wherein she is employed, and the competency of the moorings, in his or their fair and impartial judgment shall require.

For the purpose of preserving a free passage between *Iron-Gate Stairs* and *Bugsby's Hole*, of such width that ships, vessels, and steam-boats, of large dimensions and draught of water, respectively, may navigate up and down the same, without impediment or risk, it is ordained that the width of such passage shall not be less than 300 feet; and, in all parts of the river, between the limits above-mentioned, wherein such passage shall be between a tier of ships, &c. and the shore, the said space of 300 feet is to be accounted from the outermost ship or vessel in the tier to the low-water mark; and in all parts of the river, within the aforesaid limits, wherein such passage shall be in the stream between tiers of ships, &c. the passage of 300 feet shall be accounted from the outer ship or vessel in one tier to the outer one in the other or opposite tier.

And, the Harbour-master upon the First or Upper Station shall provide the greatest possible accommodation for shipping in the coasting and other trades, between *London Bridge* and *Iron Gate Stairs;* maintaining, as far as practicable, a navigable passage of not less than 200 feet for ships and other vessels, passing up and down that part of the river.

The undermentioned tiers are to be used, exclusively, by *Collier ships or vessels*, which are to be placed as near to the respective shores as the depth of water will permit; and no more shall be allowed to remain moored and distributed thereat, at any one time, than the nnmber specified as follows:

On the North side of the River;—At Cole's Stairs tier, 20; ten with their heads upward, and ten downward. At Bell Wharf tier, the same. At Stone Stairs tier, 18; nine with their heads upward, and nine downward. At Ratcliffe Cross upper tier, 16; eight with heads upward, and eight downward. At Ratcliffe Cross lower tier, 15; eight with their heads upward, and seven downward.

On the South side of the River;—At Hanover Hole tier, 20 ships; ten with their heads upward, and ten downward. At Mill Hole upper tier, the same. At Mill Hole lower tier, 18; nine with their heads upward, and nine downward.

When the whole number of colliers are so placed, as aforesaid, the Harbour-master upon the second or centre station, is to distribute any greater number at the most convenient other tiers, or parts of the river, and in such further numbers as shall allow of a free passage, before described, so as to preserve the breadth of 300 feet; but if the space occupied by the number of ships, arranged as above, shall encroach upon the width of the free passage, the number is to be reduced.

No collier ships are to be anchored between the tiers above mentioned, nor in any part of the navigable water-way between London Bridge and Limehouse; under a penalty, to be paid by the master or commander, not exceeding £5.

The Harbour-master on the third or lower station is required to detain, at any place between Limehouse and Bugsby's Hole, all vessels coal-laden, or in part coal-laden, and prevent them from entering the Pools whenever the Harbour-master at the second or central station, or the principal Harbour-master, shall deem it necessary and so direct; and when it shall appear to the Harbour-master on the second or central station, or the principal Harbour-master, that no more vessels coal-laden, or in part coal-laden, should proceed up the river higher than Limehouse, then the Harbour-master on the third or lower station, is to cause a flag, half red and half white, to be hoisted on a flag-staff, provided for that purpose, at or near the Harbour-master's station at Greenwich; and in case any master or commander of any vessel, so laden, shall proceed up the river higher than Limehouse, when such flag is displayed, or shall remove from his moorings without permission, in writing or printing, first obtained, from the Harbour-master of the lower station, he shall forfeit a sum not exceeding £10.

Either of the Harbour-masters may give a printed or written notice and direction, for the removal, within a reasonable time to be specified, of any vessel or boat which shall, at any time, be so moored or placed as to encroach upon the free passage aforesaid, to such other place as he in his discretion shall see fit; such notice to be given to the person having the command or charge of the said vessel or boat, &c. or left with some person on board thereof; and in case the person having the charge or command, shall refuse or neglect to comply with the said notice, he will be subject to a penalty not exceeding £10; and the Harbour-masters are directed to employ persons to remove the said vessel or boat, &c. at the expense of the person having the command, or the owner thereof.

In case any person having the command or charge of any vessel, boat, or craft, or of any raft of timber, or of any masts, spars, or yards, shall lay at, place, make fast, or moor, the same in any of the inshore passages, or ferries or upon the banks or shores of the river, between London Bridge and Limehouse, so as to obstruct the free transit of any other vessel, boat, or craft, he becomes liable, for every such offence, to a penalty not exceeding £5, and the Harbour-masters, with assistants, may remove such impediments at the expense of the owners, or person having the charge thereof.

It shall not be lawful for any float or raft, or floats or rafts of timber, either singly or together, exceeding 60 feet in length, (excepting timber in one length,) and 20 feet in width, to go into and pass along any part of the stream between Limehouse Hole and London Bridge; nor for any float or raft exceeding 40 feet in width to go into or pass along any other part of the stream between Limehouse Hole and the lowest part of Bugsby's Hole; nor for any two or more floats or rafts to go or float abreast; nor for more than three in one body to go into or pass along any part of the stream between London Bridge and Bugsby's Hole lengthwise; nor for any following float or raft to go within the distance of 300 yards of any other float or raft floating upon the stream within the limits last mentioned; in any of these cases the owners, or person managing, directing, or towing, the same, shall forfeit the penalty of £5.

Every barge, lighter, boat, or other craft, passing along any part of the river, within the limits aforesaid, shall singly and separately pass along the same; and if any two or more barges, &c. lashed or connected together, be found within the limits aforesaid, the owner or persons having charge thereof, shall, for every offence forfeit 40*s*. But any luggage-boat, skiff, wherry, or ship's boat, may be lashed at the stern of a barge, lighter, or other craft, not exceeding the burthen of ten tons.

During the time that any barge, &c. shall be passing along the river, within the limits prescribed, one able and skilful man, at the least, shall be constantly on board for conducting the same. Penalty for omission, 40*s*. If the person or persons on board quit the barge, lighter, &c., during the passage, he shall forfeit 40*s*.; and the Harbour-master, with assistants, may remove the same, at the expense of the owner or master thereof.

When an anchor shall be dropped or let down into the stream from any vessel, boat, or craft, for the purpose of stopping tide or mooring, there shall be bent to the same a sufficient buoy and buoy rope. Penalty for neglect, on the master or commander of such vessel, &c. 40*s*.

No anchors shall be suffered to remain in the stream without the line of the tiers, so as to endanger any ship, vessel, or craft, which may be passing. Penalty on the master suffering anchors so to remain, (after due notice given by a Harbour-master,) not exceeding £5.

No ship, vessel, or boat, shall bring up or stop, so as to encroach upon or obstruct the free passage before described; or if, after lying in any tier, it shall, on quitting the same, and getting into the stream of the fairway, let go an anchor, (except for the purpose of navigating,) or shall deliver any part of the cargo, or take in ballast, while lying in the stream of the fairway, until it shall have arrived below, or to the eastward, of all the collier tiers, under a penalty not exceeding £5.: and the Harbour-masters shall remove such anchor at the expense of the owners of the vessel or person having charge of the same.

No ship, vessel, or craft, shall navigate or lie in the river between Bugsby's Hole and London Bridge with its anchor or anchors a-cock-bill; that is to say, hanging perpendicular by the stopper from the cathead; and the master or commander who shall suffer the anchors to be so carried, shall for every offence forfeit £5., and for every anchor so carried the further sum of 40*s*. The exception is only while in the act of fishing the anchor, or during such time as may be absolutely necessary for getting the vessel under way, or bringing her to anchor.

No vessel or craft is to lie in the river with its anchor or anchors hanging by the cable perpendicular from the hawse unless the stock shall be awash, under a penalty for every anchor so carried, of £5. Provided, however, that no commander shall be liable to a penalty for having the anchor so hanging during such time as may be absolutely necessary for getting the vessel, &c. under way.

In the loading and unloading of all ships and other vessels, in any tier within the limits prescribed, when it may be found requisite for craft to lie alongside, for the purpose of receiving or delivering goods or ballast, the Harbour-master may direct the captain or commander to slack off the same; and if such commander shall refuse or neglect to slack off when so directed, he will be subject to the penalty of £5.

No ships, vessels, or craft, which shall be laid or stationed in any tier in the river, within the limits aforesaid, shall lie or be boomed off from each other, unless when necessary for the purpose of admitting any lighters or other craft alongside the same, as hereinafter mentioned; and all such ships, vessels, and craft, excepting the outer one at each end of every such tier, shall be laden over the bows and not otherwise, unless from the weight or bulk of the goods, or the nature of the merchandize, it shall be deemed necessary to load alongside; and when it shall be found necessary by the Harbour-master to load such goods alongside, the captain or commander, when required, shall, as speedily as possible, slack all the breast-fasts of the vessel, for the purpose; and if he shall not obey, and execute the orders of the Harbour-master, in relation to the mooring, unmooring, or removing, &c., he shall forfeit the sum of 40*s*.

Every captain or commander of a ship or other vessel, which shall be moored or navigating on any part of the river, between London Bridge and Bugsby's Hole, with a warp or hawser, or having a rope across for any purpose, (unless in the act of entering or departing from any dock,) shall slack the same down on the approach of any other ship, vessel, or boat, which shall be proceeding, dropping, or sailing, with or against the tide, on pain of forfeiting for every instance of neglect, a sum not exceeding £5.

If any master or commander of a ship or vessel, or any other person, shall in any way obstruct the Harbour-masters, or either of them, in the execution of their duty, or use threatening language to them, or either of them, such master, &c. shall forfeit, for every such offence, a sum not exceeding £10.

Either of the Harbour-masters may order the yards and topmasts of all ships, vessels, and steam-boats, lying in the river, between London Bridge and Limehouse, to be struck, whenever, in his judgment it shall be expedient, for the general safety, so to do; and every captain or commander shall immediately obey such order, on pain of forfeiting, for every instance of disobedience, the sum of 40*s*.

Nothing in the new Bye-laws affect the dock establishments, nor the Corporation of the Trinity-House, nor the Lords Commissioners of the Admiralty, as to laying mooring chains, &c., for ships of the Royal Navy in the river below Greenland Dock, nor the Lord Mayor of London, as conservator, &c.

The following NOTICE to PILOTS *and* OTHERS, navigating the River Thames, was issued from the TRINITY-HOUSE, London, on the 6th of June, 1828:—

"It having been communicated to this Corporation, by direction of the Master-General and Board of Ordnance, 'that orders have been recently issued for all vessels employed by or belonging to the Ordnance, having gunpowder on board, to hoist a *Red Flag at the Mast-head*, to guard against the too near approach of any vessels, particularly steamers, and thereby prevent as much as possible the smallest risk of accident from the fires which the small traders have on their decks, and from the funnels of the steam-vessels:'

"And 'as it appears that this distinguishing mark has not been sufficiently understood, but that instances have since occurred of steam-vessels running close to windward of ordnance vessels at Woolwich, even when at work with their hatches off, and probably with loose powder on their decks, shaken out of the different packages,'—

"The regulation before adverted to is hereby made public, and all masters of vessels, pilots, and other persons having the command or charge of steam-vessels and other vessels and craft navigating the River Thames, are hereby cautioned not to approach any vessels at the mast-head of which a *Red Flag* as aforesaid shall be displayed."

Steam Vessels.—By order of the Lord Mayor, 24th June, 1830, all steam-vessels, when bound up the river, are required, upon arriving at the East wing of Greenwich Hospital, to be reduced in velocity, so as not to pass through the water, with a flood-tide, at a rate beyond four miles an hour, or against the ebb-tide at a rate beyond six miles an hour, until their arrival abreast the Limehouse entrance of the West-India Docks; and from thence to their moorings the rate must be farther reduced, so as not to pass through the water, with flood-tide, at a rate beyond three miles an hour, or against the ebb at a rate beyond five miles. The same regulations to be observed on their outer voyages.

They are also required to be on their guard, when coming near deep-laden barges, or other craft, passage-boats and wherries, to check their rate or velocity; and on no account (except when landing passengers) shall any steam-vessel, following any other steam-vessel, endeavour to pass the same after arriving upward at the Limehouse entrance of the West-India Docks, or until they shall have arrived there on their downward voyage, and so on in succession.

When they cannot arrive at their point of destination before dark, a lantern with a strong light, is to be hung out either at the bows of the vessel, or where it shall be deemed most useful, in order to prevent accidents.

DESCRIPTION OF THE RIVER, &c.

The RIVER.—The Different Bends of the Thames, between London Bridge and the Sea, are denominated Reaches, and they lie in the following order:—1. The Upper Pool; 2. The Lower Pool; 3. Limehouse Reach; 4. Greenwich Reach; 5. Blackwall Reach; 6. Bugsby's Reach; 7. Woolwich Reach; 8. Gallions; 9. Barking Reach; 10. Halfway Reach; 11. Erith Reach; 12. The Rands; 13. Long Reach; 14. St. Clement's or Fidler's Reach; 15. Grays' Reach or Northfleet Hope; 16. Gravesend Reach; 17. The Hope; 18. Sea Reach, which extends to Leigh Roads. The principal towns below London are *Deptford, Greenwich, Woolwich, Erith and Gravesend*; all on the right or south bank of the river.

The UPPER POOL, from London Bridge to Wapping-ness, extends one mile and one tenth.* It is a scene of bustle and animation, terminated by a noble bridge of five arches, of which the first stone was laid on the 15th day of June, 1825, and which was formally opened by his late Majesty King William IV., on the 1st of August, 1832. The length of this bridge, from shore to shore, is 970 feet.

Beyond the Bridge, on the S.W. is seen the venerable tower of *St. Saviour's church*. On the same side of the river, below the bridge, is the smaller church of *St. Olave*, and thence follows a dense mass of buildings and wharfs, bordered with coasting vessels, to beyond the extent of the Reach.

The left bank, or north shore, presents the Monument *of the Fire of London*, a noble Doric column, 202 feet high, admired both for its magnitude and the beauty of its proportions; also the church of *St. Magnus*, near the Bridge, close to which is the *Adelaide Hotel* and the upper wharf for the Gravesend and Margate Steam-packets; these lie alongside, and proceed thence at regular hours, daily, however be the tide. At one tenth of a mile below this wharf are the stairs, dock, wharf, and celebrated fishmarket, of *Billingsgate;* whence steam-packets depart for Gravesend, four times a day. Immediately beyond Billingsgate is the new and magnificent *Custom House*, fronted by its ample terrace or embankment; and, at a cable's length below the latter, is the antient *Tower of London*, with its numerous and stately buildings.

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* As we give the distances, generally, in *sea*-miles, it may not be improper to notice that statute miles are gained by adding 3 to every 20, or in that proportion. Hence a nautic mile is equal to $1\frac{3}{20}$ statute. One-tenth of a sea-mile, or a cable's length, is nearly equal to a statute furlong; the first containing $608\frac{4}{10}$, and the second 660, feet.

At the wharfs between London Bridge and Billingsgate, and at those between the Custom House and Tower, lie numerous coasting vessels, which here load for their respective ports; also the Rotterdam and other packets, the Hull steam-packets, &c. Almost immediately below the Tower are the stupendous warehouses inclosing the Docks and Basin of the *St. Katharine's Dock Company*. A wharf on the west side of the entrance of the Basin is appropriated to steam-vessels, which here receive passengers, and proceed at regular stated periods for Gravesend, Margate, Ramsgate, Southend, and Chatham, as well as for Harwich and the Northern ports of England.

We now approach the principal Entrance to the *London Docks*, lying at the distance of a mile eastward from London Bridge. It is almost superfluous to state that these docks are generally occupied by vessels exhibiting the flags of all nations, and that their warehouses are loaded with wines, spirits, and the various products of all climates, those of the East and West Indies, timber, and fish-oil, excepted. At one-eighth of a mile from the entrance to the London Docks is *Wapping-ness*.

The central Entrance to the London Dock is exactly opposite to the new church of *Bermondsey*, known by its small but handsome spire. On each side of the entrance is a dolphin, and these, with a transporting buoy, in the middle of the river, mark the proper channels into the Basin.

In the middle of the river between *London Bridge* and the *Custom House*, is an extensive shoal, the upper part of which is nearly uncovered at low tides; but, near the steam-packet wharf there is a depth of 11 feet. A mud-bank, to a considerable extent, surrounds Wappingness, and there is another, less extensive, on the opposite side, above Fountain Stairs: but the depths, in mid-channel, between the Tower and Wappingness, are 15, 14, 12, and 16 feet; and, allowing spring-tides to rise 17 feet, the greatest depths, at high water, will consequently be 32, 31, 29, and 33 feet. This circumstance gives the Thames pre-eminence over all the rivers of continental Europe.*

If bound downward, with an adverse wind, it will be best to begin to warp down with the first of the flood; but, with the wind favourable, you may wait until near high water, so as to clear the Lower Pool at the beginning of the ebb, ready to fall down, or work through, Limehouse Reach.

The LOWER POOL extends from Wappingness to the Entrance of the *Regent's Canal*, below Ratcliff Cross. Its extent is E. by N. and W. by S. nine-tenths of a mile. The busy aspect of the Upper Pool continues, and the colliers of Newcastle, Sunderland, &c., here unload, in myriads of chaldrons, the '*Black diamonds of the North*.' The most conspicuous object on the right bank, is the spire steeple of St. Mary, Rotherhithe, with its useful clock; and, throughout the reach may be seen, to the East, the elevated steeple of St. Anne, Limehouse. At *Wapping New Stairs*, the first stairs below Wapping-ness, is the *Thames Police Office*.

The Entrance of the *Grand Surrey Docks* and *Canal*, marked by a dolphin on the western side, is three furlongs below Rotherhithe church. The docks are used, chiefly by the Canadian timber-ships, corn-vessels, and light or unemployed shipping.

Nearly opposite to the Entrance of the Grand Surrey Canal Dock, is that of the new *East London Dock*, which is just two statute miles below London Bridge. To the northward of the latter is seen the new and elegant steeple of St. Paul, Shadwell; and on the south or opposite side is a vast granary.

The right or south side of the Lower Pool is bordered by a bank, which commences near Rotherhithe church, and extends around the projecting land into Limehouse Reach. At the lower part it extends one-third over the river, and a great part is uncovered at low water. There is a smaller bank between Bell Wharf and Stone Stairs, on the opposite side; and there is, likewise, a bank of 9 feet water, near the middle of the river, between New Crane Stairs and the Entrance of the East London Dock; but the general depths, in the Channel way, are from 16 to 13 feet at low water. The ebb-tide sets strongly upon the shipping in the lower part of this Reach.

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* From twenty-six years' observations, it appears that the mean depth of high water at the entrance of the *London Docks* is 21.3 feet; at high water, spring tides, 22.8 feet; neap-tides, 19.6 feet. The depth at the caisson at the entrance of the great basin of *Sheerness*, at high water of spring-tides, is 26.3 feet; neap-tides, 22.6 feet; low-water, spring-tides, 8.7 feet; neap-tides, 11.3 feet. Level of the mean high water-mark at London above that at Sheerness, only 2.2 feet, or less than 2 feet 3 inches.—(*Phil. Trans.* 1831, part i. 167.)

LIMEHOUSE REACH, a mile and a half in length, lies N.N.E. and S.S.W. or nearly in a *true* North and South direction, and its eastern shore is formed by the *Isle of Dogs*. Two or three windmills, on this side, memorialize a greater number which formerly decorated the shore, still called *Mill Wall*. The places of the decayed mills are now occupied by manufactories of iron, oil, cement, &c., and, at the lower end, is a manufactory of iron cables. On the right bank are the COMMERCIAL DOCKS, with their extensive timber ponds, the shipyard of Messrs. Gordon, the *East Country Dock*, the *Naval Victualling Office*, and the *Royal Dock Yard* of Deptford, with its extensive storehouses, &c.*

The space on the left, between Limekiln or Limehouse Dock and the western entrance of the West-India Docks (noticed hereafter) is known by the name of LIMEHOUSE HOLE, and is frequently crowded with foreign vessels. On the right, opposite to the Dockgates, is *Cuckold's Point*.

Just below Limehouse Hole, not far from shore, is a shoal, having only 4 or 5 feet over it at low water. In some parts of the Reach are 10 or 11 feet; and in the Hole 16 feet. The bank from Cuckold's Point extends one-third over the river, and the high spire of St. Paul's, at Deptford, on the edge of the Stone-Wharf on the Isle of Dogs, leads clear of it. The best water here, in mid-channel, is from 15 to 18 feet.

In the middle of the Reach is a shifting bank, the best water near which, on the western side, is 13 or 14 feet; and, on the Isle of Dogs' side, opposite to the Victualling-Office, a hard shelf stretches about one-fourth over the river. To clear this, keep Deptford spire, above-mentioned, just open to the westward of the clock house in the Royal Dock-yard.

Off the King's Anchor Wharf, rather close in-shore, is a shoal nearly dry; although without it are 16 and 17 feet of water.

GREENWICH REACH.—This Reach lies in a semi-circle, from S.E. to E.N.E., one mile. The north shore is flat and monotonous; its most conspicuous objects being a few small straggling trees, the *Isle of Dogs' ferry-house*, and a solitary establishment formerly occupied by the '*Steam Washing Company*.' On the opposite side we have, however, a splendid contrast, in the populous town of *Deptford*, with its two churches; *Greenwich*, with its two elegant churches, its hospital, and other noble structures. These towns are separated by the *Ravensbourn*, here called *Deptford Creek*. From this creek the shore of Greenwich forms a variegated crescent of four-fifths of a mile, which is backed within by fine rising land, constituting the Royal Park, and crowned by the *Royal Observatory*.

In the river, a little below the dock-yard of Deptford, is moored the old '*Dreadnought*,' a renowned ship, formerly of 98 guns, now usefully appropriated to the benevolent purposes of an hospital, for the sick and disabled seamen of all nations. Astern of the Dreadnought is the frigate *Iphigenia*, given by government for the use of that patriotic institution the Marine Society. Two vessels in this reach are also fitted up as chapels for seamen.

At a short distance above Greenwich Hospital is the *Ship Tavern* and stairs: and, at some distance below it, is the *Crown and Sceptre*, with its white front, a house of recreation much resorted to by the London gentry. Next to this is a neat quadrangular building called *Norfolk College*, founded and endowed by Henry Howard, Earl of Northampton, (brother to the Duke of Norfolk) in 1613, now the comfortable retreat of twenty decayed housekeepers, and in trust of the Mercers' Company of London. Adjoining to this, on *Anchor Wharf*, is a singular old mansion, painted white, with adjoining warehouses, occupied by the iron-masters, Crowley, Millington, and Co.; and, at the eastern extremity of the town, are two respectable houses of entertainment, known by the signs of the *Golden Anchor* and *Union Jack*, commanding the entire view of Blackwall Reach, the Isle of Dogs, &c.

GREENWICH TIME-BALL.—This useful apparatus was placed, in 1833, on the cupola of the eastern turret of the Royal Observatory. It consists of a ball, about 5 feet in diameter, which is perforated by a pole, about 16 feet in length, at the top of which are four arms, with letters, set to the true cardinal points. The whole is surmounted by an arrow vane. At five minutes before one, *p. m.*, every day, the ball is drawn half way up the pole; at two minutes before one it is raised to the top, close under the arms; and at one o'clock, *mean solar time,* it falls to the bottom of the pole, where it remains until afternoon of the next day.

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* The Commercial and East Country Docks are used by timber ships, &c., which bring wood of every description; also hemp and flax, tallow, pitch, rosin, turpentine, oil, and whalebone. By the regulations of the Port, no timber is, without special permission of the Harbour-master, to be unladen in the river above Limehouse Hole.

The following is a copy of the official notice:—"The Lords Commissioners of the Admiralty hereby give notice that a ball will henceforward be dropped every day, from the top of a pole on the eastern turret of the Royal Observatory, Greenwich, at the moment of one o'clock, *p.m.* solar time. By observing the first instant of its downward movement, all vessels in the adjacent reaches of the river, as well as in most docks, will thereby have an opportunity of regulating and rating their chronometers. The ball will be hoisted half-way up the pole at five minutes before one o'clock, as a preparatory signal, and close up at two minutes before one."

For a description of the machinery, see *Nautical Magazine*, October, 1835, p. 584.

On the south side of Greenwich Reach is a shoal, commencing at Deptford Creek, and extending to some distance upward. Another, from Deptford Creek, downward, to below the Hospital. They are nearly dry at low water, but without the edge the depths are 13 and 14 feet. The clock-house on the two trees in Deptford-yard clears, but carries you near, the edge of the Deptford shoal. The marks for the shoal off the upper part of Greenwich are, Greenwich church on the boat-yard, and Woolwich church open to the northward of Greenwich. In a fair-way are 15 and 16 feet of water. Below Garden Stairs, with Flamsteed House, or the Observatory, a little open to the westward of the Hospital, there is not more water than 10 or 11 feet, at low springs: but, farther down, with Flamsteed House open of the S.E. part of the Hospital, and toward the Isle of Dogs, there are 16 feet at low springs.

Upon the north side, opposite the Anchor Wharf, and close in-shore, is another shoal: this may be avoided by keeping the storehouse clock, in Deptford Yard, open to the southward of the Isle of Dogs' ferry-house, until Blackwall Reach comes open.

Vessels may anchor off the Isle of Dogs, from below the Ferry-house and upward, in several places, having from 15 to 18 feet; but the best place is lower down, with the Royal Observatory, on Greenwich hill, open to the eastward of the Hospital.

BLACKWALL REACH, extending from the lower part of Greenwich to the East India Docks, at Blackwall, in a curve N. by E. and N.E. The shore on both sides is low, the greater part unvaried marshes, with rich pastures. At a short distance down the Reach, on the right bank, and insulated from other buildings, is the conspicuous '*Rope and Canvas Manufactory*' of Messrs. Enderby, noted for its steam apparatus and beautiful machinery. At half-way down, on the left bank, is the *Folly House* and tea-garden, at six statute miles from London Bridge; and, at two furlongs lower, are the *West-India-Dock* and *Gun Taverns.* Here BLACKWALL commences, and within a quarter of a mile farther are the *Artichoke*, the *Plough*, and the *King's Arms*, taverns, much frequented by those who delight in viewing the shipping on the river, as each commands an extensive prospect over the low lands, to Woolwich, Charlton, Greenwich, and the beautiful amphitheatre formed by the Kentish hills. Behind these houses, on the West, are the extensive docks for the *West-India trade*, and below them, to the East, are those for the *East India ships*, with a high and remarkable wooden structure, painted red, for placing and replacing the masts of ships, and which serves for a mark far down the River; all of which are situated and formed as shown on the chart.

Above and adjoining to the East-India Docks is a considerable portion of the once-celebrated dock-yard of Mr. Perry, now the establishment of Messrs. Green, Wigram, and Green; and between is the new and elegant house, called the *Brunswick Tavern and Hotel*, built by the East-India Company, and communicating directly with the East-India Road by a branch road lately formed. Next to this, in front of the docks, is a spacious wharf, 750 feet long, with commodious warehouses, and such a depth of water in front, that steam-vessels may arrive at and depart from it at any time of the tide. Close to the wharf are 11 feet at low water; but it is to be noticed that some of the vessels draw 14 or 15 feet. This wharf forms a terrace, commanding a delightful view of the river, down both Reaches, to the east and the west, and over the marshes to Charlton, &c.

Below the East-India Docks and basins, the River Lea (dividing Middlesex from Essex) falls into Bugsby's Reach, at nearly seven statute miles from London Bridge. Immediately above the Lea is the *Orchard-House Tavern*, and a small building-yard; and within the Lea, more commonly called *Bow Creek*, on its western bank, is situate the Buoy Wharf of the Hon. Corporation of Trinity House. Here are deposited, until required for use, the buoys and vessels of the corporation. On the left of the entrance is the house of the master of the Trinity yacht, Captain Poulter.

At the entrance of Blackwall Reach, on the left or western side, is a broad shelf, extending from *Saunders-ness*, the S.E. extremity of the Isle of Dogs; and this shelf continues, narrowing and spreading, down to Blackwall. Near the entrance of the West-India South Dock it is called the *Gun Shoal*. Here, for many years, lay the *West-India Naval School Ship*, which has lately been removed into the West-India South Dock; and vessels approaching have been cautioned to take especial care to avoid the shoal, "as it lies outside the late berth of the School Ship."*

A shoal also borders all the right or eastern side of this Reach, and widens toward and around its lower extremity, called *Lea-Ness* or *Blackwall Point*, where, at low water, it is uncovered to one-fifth over the river, opposite to Wigram's Dock-yard. There is a shifting middle-ground above the Folly-House, and there is another opposite to *Lea-Ness*, at about two thirds over, toward the Blackwall Docks. The latter is a cable's length in extent, and has from 5½ to 8 feet over it at low water. Between it and the north shore the depths are from 16 to 19 feet, and on the south side from 14 to 20 feet. The general depths, in the best water of the Reach, above Blackwall, are from 23 to 18 feet, as high as the Folly-house; and above that 16 to 13 feet. Toward the lower part of the Reach the ebb-tides set with rapidity.

During tide-time, as a signal that vessels may enter, a *blue flag* is hoisted on the south side of each entrance to the West-India Docks, with '*West India Docks*' thereon. The spire of Poplar new church kept a little to the left of the flagstaff at the entrance of the Basin, leads directly down, in mid-channel, to moorings off the upper part of Blackwall.

From the Folly-house to the upper part of Blackwall, vessels may anchor in from 12 to 16 feet of water, on the western side, with the clock of Norfolk College just open of Saunders-ness. On the eastern side they may likewise anchor in 18 or 19 feet at low water, and may moor with the same clock open of Saunders-ness.

BUGSBY'S REACH extends S. by E. ½ E. and N. by W. ½ W. nearly one mile, and is bounded on each side by the levels and marshes. Its upper point, on the right, is *Lea-Ness*, above mentioned, and its lower point, on the left, *Hook-ness*. Just above the Lea is the Orchard House Tavern and other buildings above-mentioned. In sailing down this Reach, you have before you the pleasant village and church of *Charlton*, on the brow of a hill, beyond which appears *Shooter's Hill*, surmounted by *Severndroog Tower*, a very remarkable structure, which may be seen from the country many miles around.† The height of this Hill above the level of the sea, at low water, is 446 feet.

Bugsby's Reach has a shelf on each side, stretching from shore, but the middle is clear, although it has but nine or ten feet at low water. The shelf on the Essex side commences at the Lea or Bow Creek, and extends thence downward, nearly to Hookness, and almost one-third over the river.

In sailing upward, you have to the N.W. the East-India mast-house, before mentioned, a most conspicuous object, seen over Lea-Ness or Blackwall Point.

There is anchorage in Bugsby's Hole, off the south shore, in 11 and 12 feet at low water; and upon the N.E. shore, in 14 feet, just above the Orchard-House causey; particularly with the two cupolas of Greenwich Hospital open, or Greenwich old church just open of the Hospital, and Woolwich Reach just open.

WOOLWICH REACH.—This Reach, which lies E.S.E. and W.N.W. between *Hookness* and *Gallions Point*, is two miles in length. The shore on the left or north side bounds the Levels of *Plaistow* and *East-Ham*, and is distinguished only by the ferry-houses, the house of a Mr. Mills, and the little brook called *Ham Creek*. On the south shore, opposite to Hookness, is a large granary and water-mill, over a sluice, which may be seen for a long way, both up and down the river; and, within half a mile below this granary is *Charlton Sand-Wharf*. Here the river widens to the breadth of three-eighths of a nautic mile, while the depths, at low water, in mid-channel, are not more than nine feet.

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* Trinity-House notice, 12th June, 1830.

† Erected by Lady James, in commemoration of the capture of the fortress of Severndroog, in India, by Sir Wm. James, in 1756.

At three-eighths of a mile below Charlton Sand-Wharf is *Woolwich Upper Ferry*, and at some distance below this is the Dock-yard, with its basin, building-slips, storehouses, &c. overlooked by the square brick tower of Woolwich Church. The town then follows to nearly opposite Gallions Point, and is succeeded by that noble pile the *Royal Arsenal*, which commands a complete view of Gallions Reach, down to Barking Creek. The *Landing-place* of the Dock-yard is nearly opposite to Ham Creek, and near it the sheer-hulk is moored.

The central part of Woolwich Reach is shoal. Between Ham Creek and the Dock Landing-place is *Ham Shelf*, which is more than a quarter of a mile in length; and, although on its upper part there are 7 and 8 feet of water, the lower part, with spring ebbs, is at times uncovered. The passage between it and the Essex shore is narrow, and has only from 8 to 10 feet of water; and hence upward, to a Ferry-house below Hookness, are 8, 7, and 9, feet. These depths extend three-fourths over the river from the north shore.

Below Ham Shelf the water deepens to 18 and 19 feet, and there is 16 in mid-channel, betweeen Gallions Point and the Arsenal. Here is the ferry of the Royal Artillery, and a respectable house of entertainment for visitors, on the north shore, at a little way above Gallions Point. A serpentine road from this house leads to East Ham, &c.

On the south shore, there is a shelf, of about 4 feet, which commences above, and thence extends to some distance below, Charlton Sand-Wharf. From Charlton down to the ships at Woolwich there is not more than 9 feet in the channel at low-water, spring-tides. The sheer-hulk which formerly lay off the dock-yard is removed, and a grand double sheers erected on the side of the new basin. The soundings hence to the end of the reach increase to 13, 16, and 18, feet of water.

The common anchorage is with the Bell Water-gate or Broad-street open, in 18 feet of water: opposite to the house on the north shore. Also in 15 feet upward, and to some distance downward. With the Upper Water-gate open, there are 16 or 17 feet.

GALLIONS REACH lies N.E. and S.W. It is one mile in length, between East Ham Level, on the West, and Plumstead Marshes on the East. At about half-way down, on the left or western side, is a solitary but comfortable house, called *Devall's House*, with a tree to the southward of it. This is the only house in the Reach. The depths in the best water are variable, 16, 17, 13, 16, feet; but there is a spot in the middle of the river, a little below Gallions Point, of 7 feet; but with 14 and 16 feet on the eastern side of it. A broad shelf extends from the eastern shore, which begins at Woolwich Warren, and extends one-third over the river opposite to Devall's House; on the edge of it are 6 and 7 feet of water. Two beacons, above Devall's House, will be noticed in the description of the next reach.*

The bank along the north shore, with the ebb, is uncovered to a very considerable distance; but near its edge the depths are, 6, 8, and 9, feet.

Margaretness or *Maggotness* terminates this Reach on the east; and, in hauling into the next Reach, you will bring the ness point in a line with four old and remarkable trees, called the *Tripcock Trees*, which will be again noticed.

When below the shoal of Gallion-ness you may haul in toward Devall's House, until Woolwich Church tower is a sail's breadth on the point. This mark leads clear of the bank stretching from the eastern shore. There are three or four good berths below Devall's House, with Tripcock trees on Margaretness, and 15 or 16 feet at low ebbs.

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* In the month of July, 1837, Beacons, with *circular target-heads*, were erected on both the Kentish and Essex Banks, in the lower part of Gallions Reach, for the purpose of denoting the limits of the range of fire from the artillery practice in Woolwich marshes, with a view to the prevention of accidents, and to denote that the space of the river within those beacons should be kept entirely clear from vessels at anchor; and subsequently, Masters, Pilots, and other persons having charge of vessels, have been strictly enjoined by the Trinity House not to stop tide nor come to anchor for any purpose, within the limits denoted by those beacons.

We may, however, venture to hope that this dangerous and improper practice, *over the river*, will be discontinued; and that the anchorage will again be free.

The New Barrack clock cupola on the old clock in the Warren, S.W. by W., is a good and distinct leading-mark down this reach. Erith Church on the southernmost of the Tripcock trees, is a good mark for the deepest water and the common anchorage.

BARKING or TRIPCOCK Reach lies in a curve, S.E. by E. and E. by N., and is a mile and a half in length. The points which form the Reach on the south are *Margaretness* and *Cross-ness*, and the shore between forms a concave line. The land on the left or north is *Barking Level;* that on the south, *Plumstead Marshes;* beyond which, on the south, is the beautiful rising land, with the Church, &c. of *Plumstead*, previously seen from Gallions Reach.

Tripcock trees above-mentioned, four in number, stand near the shore, at rather more than a quarter of a mile below Margaretness, and near them is a beacon, which further distinguishes this spot. Here a shelf extends from shore nearly one-third over the river, having on its outer edge, 7 and 8 feet of water; but, in mid-channel between, are from 14 to 17 feet. Directly opposite to Tripcock trees is the entrance of *Barking Creek*, having on its eastern side, a public house and tea-room, resorted to mostly by the fishermen of Barking, who are chiefly employed in the cod and haddock fishery. From the river may be seen, to the north, the tower of Barking Church, which is about a mile and three-quarters distant. There is good anchorage off Tripcock trees, in 12 and 13 feet of water.

Barking Point is three-eighths of a mile below the Creek, and the shore thence curves to the northward to *Half-way Corner*. At a quarter of a mile above Crossness, on the Kentish shore, is the Powder Magazine of Plumstead, with a dwelling house, some trees, and a wooden Jetty.

In the middle of the Reach is *Barking Shelf*, a dangerous shoal, five-eighths of a mile in length, on which there are only 5, 6, and 7, feet of water: its west end is at nearly a quarter of a mile below the mouth of Barking Creek, and its east end at about the same distance above Cross-ness. It was on this shoal that H. M. store ship *Grampus*, of 54 guns, grounded and was wrecked in 1799.

In the channel, on the north side of this shoal, above Barking Point, the depths are only 6, 7, and 8, feet; but below the point they increase to 12, 15, and 20, feet. In the southern channel the depths are 9 to 15 feet.

Near the high-water mark, at a short distance above Devall's House, is a beacon with a lozenge head; and in the field, at some distance within this, is another. These beacons in one are a leading mark for sailing down the lower part of Gallions until two similar beacons above Plumstead Magazine, on the south- shore, appear in a line; and then the latter, in such direction, lead clear of the south side of Barking Shelf; you now follow the trend of the shore down to Plumstead Magazine, and thence haul more to the northward for mid-channel, and so pass Crossness, with the south edge of Purfleet Hill, down the river, just open of Jenningtree Point.

HALF-WAY REACH lies curving, but nearly S.E. one mile and a half. Its terminating points, on the south side, are *Cross-ness*, and *Jenningtree Point*. On the north side are Dagenham and Hornchurch Marshes; on the south those of Erith. Over the latter are seen the beautifully wooded park and the house called *Belvidere*, the seat of Lord Say and Sele, (late of Lord Eardley,) near Erith.

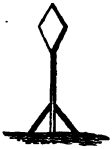
On the shore, at one quarter of a mile below Cross-ness, is the *Half-way House*, with its little wooden jetty. It is a homely public house, distinguished by the sign of the *Leather Bottle*. At seven-eighths of a mile lower, on the same shore, is *Erith Magazine*, with a dwelling-house a little below it, at nearly half a mile above Jenningtree Point. On the north shore, east of Cross-ness, is *Dagenham Breach House*, a small white circular thatched house, used by the anglers who visit the pool called *Dagenham Breach*, which was formed by an extraordinary high tide, in December, 1707, and increased by subsequent neglect. *Breach Point* is a quarter of a mile more to the S.E.; and, at three-eighths of a mile below the last, is *Bourne Brook*, which may be recognized by a modern house, a little above it.

The flat which begins above Cross-ness extends outward, off the Half-way House, one-fourth over the river, and has on its edge 6 and 7 feet of water. On the opposite side is a similar flat, which increases downward to Breach Point, where it projects one-third over the river. Near its extremity, Dagenham church, to the N.E., appears in a line with the sluice upon the north shore, a little above the Breach House. The *leading mark* between both is the southern edge of Purfleet Hill on with Jenningtree Point, untill you advance to the middle of the river off Erith Magazine, and thence, in mid-channel, toward Rainham Creek.

Half-way Reach has good anchorage throughout; but the common roadstead is abreast of Bourne Brook, on the north side, with Jenningtree and Cold Harbour points in one, and 20 feet at low ebbs. There are several good berths on the north shore from two-thirds down the reach, in 18 feet, and on the south side three or four more, in 13 or 14 feet.

ERITH REACH lies S. by W. and N. by E., and is a mile and a half in length. On its eastern side are Rainham and Wennington Marshes; on the western side are Erith Marshes, and to the S.S.W. is the village of ERITH. *Rainham Creek*, distinguished by its Ferry-House and Tea-Room, falls into the upper part of the Reach. At a mile to the N.E. from the mouth of the creek, are the village and church of Rainham. The last may be known by its short white spire upon a tower steeple.

Below Rainham Creek, on the same side, are the small houses known by the names of *Little* and *Great Cold Harbour*. The latter is near the end of the Reach, and gives name to *Cold Harbour Point*. On the S.W. side of the Reach is the rural Church of Erith, and a little below it is a white beacon, shaped as in the margin, which has been erected as a leading mark for the next Reach. Erith Church has a spire, and is partly covered with ivy. To the west of it is the *Belvidere Park*, beautifully wooded, and surmounted by a square tower. At the bottom of the reach is ERITH.*



Jenningtree Sand, below Jenningtree Point, extends one-third over the river, opposite to Rainham Creek; and on its edge, where there are 4 feet at low water, there formerly lay a wreck. You will clear it by keeping Barking Church within a sail's breadth of Dagenham Breach Point, and hauling over with Rainham Church a little open to the northward of the Ferry House, N.E. by E. The course hence down the middle of the river will be S. ¾ W. until Erith church bears W.S.W. The best water is toward the Kentish shore. You will now, by hauling westward, bring a remarkable elm-tree in one with the *Bavin Wharf* at the eastern extremity of Erith. These objects in one, bearing south, lead safely through the rest of this Reach, and clear of the shoals which extend, nearly half-way over the river, from *Cold Harbour Point*, and have over them only 4 and 5 feet of water at low ebbs.

Vessels may anchor in Erith Hole, in 4 fathoms, with Erith Church bearing W.S.W. There are two or three good berths for India ships, in 4 fathoms, at low ebbs, off Cold-Harbour Point, with Erith S. by W.

If bound from Erith Hole upward, you may proceed with the objects above-mentioned until Rainham church appears on with the Ferry-house; approaching toward the north side, with this mark on, until you have passed Jenningtree Sand; then, having brought Barking church within a sail's breadth of Dagenham Breach Point, you may steer for Half-way Reach.

The RANDS.—This is the Reach between Erith and Purfleet, having Wennington and Avely Marshes on the north, and Crayford Marshes on the south. It extends E. by S. and W. by N. one mile and a half.

The pleasing view of *Purfleet* is seen throughout the Reach, with the elevated land beyond, called the *Beacon Hill*, which is crowned with a small circular observatory, a flagstaff, &c. This place was antiently called *Pourteflete;* and here, in the time of Queen Elizabeth, stood a beacon intended to give intelligence of the approach of an enemy. On the western side of the village, facing the river, and by the edge of a creek, are magazines, erected by the Board of Ordnance, which are strongly arched and every way secured for the protection of gunpowder. On the hill is a handsome house, which is that of the storekeeper; and a conspicuous public-house or tavern stands by the landing-place. Purfleet is noted for its lime, chalk, and sand-works, belonging to the respected house of Whitbread.

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* In 1837 a *green buoy* was placed near a wreck in Erith Reach in 11 feet of water, with Erith Church twice its length open to the right of a windmill on the back land; and a windmill its length open to the right of Cold Harbour Point, bearing S. ½ W.

Near the middle of the river, in the upper or western part of the Reach, is a shoal, called the *Randhill*, which is one-third of a mile in length, and has 6 or 7 feet over it at low water. Its upper end lies with Jenningtree and Cold Harbour Points in a line; and the lower end with Dartford church on with the opening of the upper creek on the south shore.

In the passage on the south side of the Randhill the depth is about 13 feet at low water; and, on the north side, 9 or 10 feet. The leading-mark through the *South Channel* is, the upper chalk-wharf at Purfleet touching *Crayfordness*, at the lower end of the Reach; you thence advance more northerly into the river, so as to avoid the flat on the south shore.

For the passage to the north of the Randhill, the leading mark is, the white beacon in Erith Reach, already noticed,* in a perpendicular line with the elevated square tower in the wood of Belvidere, and bearing nearly W.N.W. Another mark is, the store-keeper's house at Purfleet in one with the second powder-magazine to the northward, and bearing E.S.E.

LONG REACH, between Crayfordness and Greenhithe, extends S.E. by S. and N.W. by N. three miles. It is bounded on the right or south side by Dartford and Stone Marshes, and on the left by West Thurrock Marsh. At one-third of a mile below Crayfordness, and opposite to Purfleet, is the entrance of *Dartford Creek*, at a little beyond which, on the embankment, is a single house, called the *New Inn*, or *Long Reach Tavern*.

At the bottom of the Reach is *Greenhithe*, a village long noted for its exports of chalk and lime.† On its east are the beautiful grounds, park, and villa, named *Ingress*, now the seat of Alderman Harmer; on the S.E. is seen the white spire of *Swanscombe*, and on the west the village and church of *Stone*. The latter is a fine Gothic structure, with a square tower, surrounded by orchard-trees. In a valley beyond is seen *Stone Castle*.

The point on the north side of the river, opposite Greenhithe, is named *Stone-ness*, a low marshy point which terminates *Long Reach*. At a short distance within it is a public house, '*The Rising Sun*.' There is a horseferry hence to and from Greenhithe.

At the upper end of Long Reach, from above Dartford Creek, the shore shoalens out to some distance, and is uncovered at low water. The eastern part of Erith town kept open of Crayfordness leads clear of it, until Dartford Creek comes open; whence you proceed, in mid-channel, down the Reach. From Stone-Ness, at the lower end of the Reach, there is also a shoal, to which a sufficient berth must be given.

There is good anchorage in the greater part of this Reach, in 5 and 6 fathoms, at low ebbs.

From the Rands the tide sets strongly upon the chalk-wharfs at Purfleet, inclining toward the east shore at half-way down, whence it sets over toward Greenhithe.

ST. CLEMENT'S, or FIDLER'S REACH.—This Reach extends E.N.E. and W.S.W. It is nearly one mile and a half long. On the North side are the village and church of *West Thurrock*, with its square tower. To the N.E. is seen *Belmont Castle*, a handsome modern castellated villa on the rising land.

The Church of West Thurrock is dedicated to St. Clement, whence the Reach takes its name. The peculiar agitation of the water in the lower part of the Reach, where there is an eddy during the flood, may have given rise to the second cognomen, "Fidler's Reach."

The marshes on the south side of the Reach are very low, and sometimes overflowed by the tide to the distance of half a mile. On the terminating point, called *Broadness*, stands a beacon, similar to that in Erith Reach, which is peculiarly useful during an inundation of the land.‡

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* This beacon was placed, by order of the Trinity-House, in March, 1830.

† Embodied in the chalk of this place petrified shells and many other extraneous fossils have been found, some of which are extremely curious and very valuable.

‡ In 1837 a *green buoy* was placed in the upper part of St. Clement's Reach, in 6 fathoms, about a cable's length below the Ferry-house, on the north shore.

A shelf, half a cable's length in breadth, lies on the east side of this reach, having over it only 6 or 7 feet at low water. It commences about half-reach down, and extends to Broadness. On the north side, at the lower end of this reach, lies the steep and dangerous shelf, called *Black Shelf*, which begins at the creek below St. Clement's church, and extends eastward to the house above Grays. Upon this shoal the tide, both ebb and flood, sets strongly.

In sailing into this, from Long Reach, give Stoneness (the point opposite Greenhithe) a sufficient berth. West-Tilbury church open to the northward of the highest tree a little to the eastward of Grays, nearly E.S.E., leads down to Grays. West Tilbury church, on the lower end of Grays' Causey, is also a common mark in sailing through the lower part of the reach.

Between Broadness and Black shelf, the tide runs narrow; hence it becomes requisite to keep in the tide-way as much as possible. On the eastern side, as there is an eddy during the flood, vessels, when turning up, must not stand far over to the eastward.

GRAYS' REACH, or NORTHFLEET HOPE, lies nearly North and South, one mile and a half. Two villages distinguish it, GRAYS THURROCK to the North, and NORTHFLEET to the South.

In entering the Reach, you have *Grays Church*, (St. Peter and Paul,) with its square steeple, directly a-head. In the town is an old-established and well-frequented corn-market, which is held every Thursday, and there is an annual fair on the 23rd of May. In sailing down the Reach you have *Northfleet Church* directly before you, half a mile to the N.W. of which is *Northfleet Creek*, separating the parishes of Northfleet and Swanscombe. Near the corner of the creek is the handsome white house known as *Ormus* or *Orm House*. Several large transporting buoys, for the use of shipping, are moored in the mid-channel of the Reach.

Below Broadness there is a flat; and on the north or opposite side lies *Black Shelf*, above described. In sailing downward, sufficient allowance must be made for the tide of ebb, which sets strongly in toward Northfleet Creek, on the S.W., and upon the three upper chalk wharfs at Northfleet.

Along the western side of this reach is a shoal of only 3 or 4 feet at low water. There is, also, a shoal commencing a little above *Tilbury-ness*, on the lower point, to which it extends. This has only 5 or 6 feet over it, and stretches one-third over the river, at about two-thirds down the reach. Gravesend mill open to the west of Northfleet-ness leads clear of it.

From mid-channel, off Grays, you proceed downward, S. ½ W., toward Northfleet Church, until the west end of Gravesend be open. With the latter bearing S.E., you will then enter Gravesend Reach.

GRAVESEND REACH, in an extent of 3¾ miles, nearly E.S.E. and W.N.W. is bounded on the Essex side by the *Tilbury Marshes*, and on the Kentish side by the shores of *Northfleet*, *Gravesend*, *Milton*, &c. Its extreme points on the north shore, are *Tilbury-ness*, and the *Coalhouse* or Upper *Hope Point*.

In entering this Reach, from that of Grays, you have in sight, on the right, *Ormus* or *Orm House*, above-mentioned, then Mr. Pitcher's ship-yard, with its spacious dock, cut out of solid chalk. Over this is seen the Church of Northfleet, dedicated to St. Botolph, and commanding an extensive prospect.

From the cliffs of Northfleet immense quantities of chalk have been exported, and in this chalk is frequently found a variety of extraneous fossils. Of flint-stones there are frequent strata; and it is remarkable that, in some of these, complete cockle-shells, of a large size, and filled with chalk, have been found.

Advancing toward Gravesend we now see the town, with its lofty steeple, and the *Windmill Hill*, to the southward of the town, which commands a prospect of all the surrounding country. Immediately on the bank of the river, above the town, are the *Bathing Establishments*, with warm and cold salt-water baths, and machines for bathing in the river. From these baths there is a promenade, and above are the beautiful green walks of *Grove House*.

Gravesend has now a very commodious and handsome pier, 160 feet long, consisting of columns or piles of cast iron, supporting a floor or stage, extending outward nearly

50 feet beyond low water mark, with a bell, clock, and lantern, on shore, supported by ornamental columns. The *Pier House*, a respectable tavern, stands on the right as you enter. At some distance lower is another pier, that of the *Royal Terrace*.

At half a mile below the Town Pier is the entrance of the *Thames and Medway Canal*. Within it is the *Canal Tavern*, and in the basin of the canal is a floating bath, with steam-boat that proceeds, by the canal and tunnel, to and from the Medway. *Denton Mill*, about half a mile lower, has been noted as a spot at which coals have been landed free from the London duty. Near this is a small water-side public-house, called the *Ship and Lobster*, much frequented by the visitors of Gravesend. From the river is seen the rural church of *Milton*, with a cluster of trees about it. Here, formerly, was the village of Milton, incorporated with Gravesend, for many years extinct, but now in a state of renovation.

Directly opposite to the eastern part of Gravesend is *Tilbury Fort*, having a strong battery, garrisoned by a small detachment, or a company of invalids. It is a regular fortification, first built by Henry VIII. as a block-house, but after the damage done to the shipping in the Thames, by the Dutch, in 1667, it was much enlarged, by order of Charles II. It contains the residence of a Fort-Major, and is used as a depôt for the recruits of the district. There is a regular ferry to this place from Gravesend.

Outward bound vessels are obliged to stop here, in order to land the Custom-house officer; and a sentinel, at the Block-house, on the eastern extremity of the town, gives notice, by the firing of a musket, to vessels coming up the river, that they may receive on board the necessary custom-house officers, who are here in waiting for the purpose. The spot beyond which no vessel is allowed to pass, without its clearance, is denoted by an obelisk of stone, erected on the bank, a little above the Canal Basin.

The shores of GRAVESEND REACH are shoal to a considerable distance from shore, but the water in mid-channel is deep, and the tide is rapid. If it be intended to anchor here, when the shipping is numerous, your vessel should have a good scope of cable at once, lest the anchor come home, and you get athwart-hawse. In the night, especially, keep well over toward the North shore.*

You proceed downward with Gravesend church open to the northward of the Block-house, until Denton and Gravesend Mills become a sail's breadth open, or the two mills and Milton church at equal distances. These marks will lead clear of the bank, called the *Oven*, stretching out from the *Coal-house Point*, more than half a cable's length from shore, and lying with the coal-house on with the east end of *East Tilbury Church*. Here you enter the *Hope*.

HOPE REACH.—The HOPE begins at the *Coal-house* or *Upper Hope Point*, and extends, between Marshes on each side, to the *Sea Reach*, N.E. and N.E. by E. At its entrance, on the left, is the *Oven*, above-mentioned; and the shelf continues along-shore to Mucking Flat, which fills all the bight between the creeks of Mucking and Stanford-le-Hope, and extends one-third over the river.

In proceeding down this reach, you see to the *eastward*, the conspicuous church of *Cliff*, with a chalk-pit below it; and to the *westward* and N.W. the churches of *East Tilbury*, *Mucking*, and *Stanford-le-Hope:* more to the N.E. are those of *Corringham* and *Fobbing*. Mucking church may be known by having a shingled spire on a tower steeple. That of Stanford-le-Hope has a tower on its north side. Corringham church has a high shingled spire, and Fobbing an embattled tower steeple. *Pitsey church*, which stands to the north-eastward of all these, has a shingled spire.

In proceeding from Gravesend Reach you enter the Hope with the mark above mentioned, Gravesend Mill a little open to the left of Denton Mill. With the Hope Point Battery small house and East Tilbury church in one, N.N.W., you will be below the Oven, and the course thence down the Hope will be N.E. ½ N. toward Fobbing church, which should be kept in this direction until Mucking church bears N.W. ½ N., and Cliff church S. by E., whence the course into Sea Reach is E. by S.

Off Mucking Flat, when turning, you may stand into 5 fathoms, or until you bring

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* There are several buoys near Gravesend and Tilbury Fort, but they are merely transporting buoys, and not intended as a direction for the navigation of the river.

Pitsey church about a ship's length on the eastern part of some trees to the east of Fobbing church.

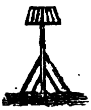
On the east side of the reach the flood-tide is slack; and, close to the shore, no tide sets at all: vessels, therefore, when working upward, must not stand too far over to the eastward: because, if the head gets into less water than the stern, it may occasion missing stays, and running on shore. Near Mucking Flat the ebb sets strongly toward the North shore.

SEA-REACH.—This Reach extends from the Hope to the Nore, a distance of 13 miles. Its general direction is E.S.E. between the extensive marshes on either side: both sides are shoal to a considerable distance, but in the channel-way the water is deep; from 6 to 8, 10, and 12 fathoms; but again shoaling eastward, to 5 and 4½ fathoms.

The whole of the Kentish shore, from the Lower Hope Point to the islet called Yantlet, a distance of 7½ miles, is bordered by an extensive flat, called the *Blythe Sand*, a great portion of which is uncovered at low water. At three miles below the Hope Point, opposite to *Holy Haven*, the bank extends nearly one-third over the river: although not far from its edge, are 9 fathoms of water. The mark leading clear of it, in the best water is, West Tilbury Mill W.N.W. ½ W. in a line with Chadwell church, and the course E.S.E. ½ E. may be continued to Holy Haven.

In sailing down you leave, on the larboard hand, the inlet called *Shell Haven*, which may be known by a house, with some trees about it, standing on its eastern bank. *Holy* or *Old Haven* is a mile and a quarter lower, and known by the houses called the *Checkers* and *World's End*, on the *Isle of Canvey*. At three-quarters of a mile beyond the latter are the *Skar Houses*. The Isle of Canvey, hence eastward, to Leigh Creek, is very low and marshy.

On the edge of the Blythe Sand upon high dry sand at low water, is a beacon erected by order of the Trinity House, in October, 1831. It stands just opposite and below the entrance of Holy Haven, with a beacon on the edge of the *Chapman*, presently to be described, bearing E. ½ S. one mile and three-quarters distant.*



Blythe Sand Beacon.

The Southern shore of Canvey Island is bordered by the bank called the *Chapman*, which extends to a mile beyond its eastern point. The greater part is dry at low water, and it extends, generally, more than half a mile from shore. From its outer edge, where Hadleigh church, bearing N.N.E., is in one with the ruins of Hadleigh castle,† Shell-haven House bears N.W. by W. ¼ W.

Upon this bank, a clump of rocky spots, called the *Skars*, stretches along shore from Holy Haven, to below the *Skar-houses*. The Skars extend a cable's length from shore, and are steep-to. The Haven's mouth, kept well open, leads clear of them. The edge is indicated by a strong rippling of the tide.

THE CHAPMAN BEACON.—By order of the Trinity House, in April, 1831, a BUOY, *chequered black and white*, was laid on the edge of the Chapman, in 10 feet of water, at two miles below the entrance of Holy Haven; but in May, 1836, this buoy was removed, and a beacon, painted red, erected in lieu of it, with the following marks:

The western side of a white house near Hadleigh church on with the eastern part of Hadleigh castle, N.N.E. ½ E.; a remarkable round-topped tree on Canvey Island half its apparent width open eastward of a farm-house upon that island, N. by W. ¾ W.; the Fairway buoy *(red)* S.E. by E. ¾ E. 2¼ miles; the Blythe beacon, W. ½ N. as shown above. This part of the Chapman is steep-to.

The Courses from off Holy Haven to Leigh Road are S.E. by E. ½ E. one mile and three quarters, and E.S.E. ½ E. 3½ miles. This leads down between the Blythe and the Chapman, within a quarter of a mile of the latter, and in the best water, 10 to 8, 7½, 5, and 4½ fathoms. Throughout this tract, the flood sets nearly true West; it is very rapid, and the courses must be regulated accordingly.

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* *The given marks* are, a conspicuous round-topped tree on Canvey Island, on with the eastern point of Holy Haven, bearing N. ½ E.; the western side of the tower of Hadleigh Castle, on with the eastern side of a farmhouse next eastward of the Skar Houses, bearing N.E. ¾ E.; and Shell Haven House, N.W. ½ N.

† Hadleigh Castle is situate on the brow of a hill, commanding a fine prospect over and beyond the estuary of the Thames. It is now almost a mass of ruins, overrun with shrubs and brushwood, but exhibits strong traces of antient grandeur.

In the fairway, at two miles below the beacon on the Chapman, is a *red buoy*,* which, on the course last mentioned, will be left on the larboard side.

LEIGH ROAD.—Leigh Road, a good anchorage, lies between the two banks named the *Leigh Middle Ground*, on the north, and the *Nore Sand* on the south. These extend in a S.E. by E. direction on each side. The shoal part of the Leigh Middle Ground lies athwart the entrance of Leigh Haven, at a mile and a half from the shore; it is a mile and three quarters long, and nearly dry at low water; but the flat, on which it lies, extends a mile and a quarter farther, and to the S.E. ¾ S.: its extremity, in 4 fathoms, lying with Shoebury-ness E. by N. two miles, and Queenborough church S.S.W. a little open to the westward of Sheerness point.

A Buoy coloured *red and white*, in stripes, was laid down upon the shoal part of the Leigh Middle Ground in 1835,—at a mile and a half below the red buoy of the fairway. This buoy is marked "*East River Middle*," and lies in seven feet at low water, with Shell-haven house and trees on with the S.S.W. part of the Skar Houses on Canvey Island N.W. by W. ¾ W., and Leigh Church N. by W. ¼ W.†

On the south side of the river, opposite the buoy of the 'East River Middle,' and one mile and a quarter S.S.W. from it, is a '*black buoy*' called that of the *Jenkin*, which is designed to facilitate the navigation of the swash called the Jenkin, lying between the Nore Sand and the Isle of Grain, noticed hereafter in the directions for the Medway. At 2½ miles below the Jenkin buoy, is the white buoy on the Nore Sand;‡ and, at a mile and three-quarters S.E. by E. from the latter is the Nore Light. Therefore, in proceeding eastward from Leigh Road, you leave the black buoy of the Jenkin, the white buoy on the Nore Sand, and the Nore Light on the starboard, while the striped buoy of Leigh Middle and a black buoy on Shoebury Knock, are to be left on the larboard side.§

From Leigh Road, with 4 fathoms of water, a direct course to the Nore Light vessel is S.E. ½ E., 5 miles; and to Shoebury Knock buoy S.E. by E. ½ E., 3½ miles. The depths will be best understood by reference to the chart.

SOUTHEND.—This fashionable bathing place is nearly 2½ miles to the eastward of the eastern extremity of Canvey Island. The houses extend in a continuous line, and have a handsome appearance from the river. The upper part of the town is elevated; it stands on a high bank of gravel, and commands extensive views. Here is a spacious hotel, with ball-room, library, &c., adapted to attract numerous visitors to this favourite spot.

A new pier has been constructed, which, from the east end of the Terrace, extends 1500 feet from the shore; and there is, in addition, a new landing causey, 4000 feet long, and 14 feet wide, over a firm bank of hard sand, and on the extremity of which is the *pier-house.*

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* This buoy lies nearly in a line, and in the middle of the River, between Leigh and Yantlet. It was laid down, in 1809, to mark the place of a sunken wreck, and has since been retained to mark the fair-way. It lies at 4¼ miles below Holy Haven, with Leigh church bearing N. by E. ½ E., the easternmost house on Canvey Island N.W. by N., and Pitsey church about a ship's length to the northward of it. The Nore Light bearing S.E. ½ E. 6 miles.

† The other marks given in the Trinity House notice are, a barn (having a remarkable round-topped tree close west of it,) upon the Isle of Sheppey, on with the easternmost windmill at Mile Town, S. ¾ E.;—Prittlewell Church, N.N.E.,—and the Nore Light, S.E.

‡ The *Nore Sand Buoy*, on the northern edge of the sand, lies with the Nore light-vessel bearing S.E. by E. two miles distant. It lies in 17 feet of water, with the East Mill on the Essex shore a little open to the eastward of the Terrace at Southend, N. by W.; the Land's End of Sheppey, S.S.E. ½ E.; Prittlewell church, N. ½ W. At the length of a cable and a half to the north of the buoy, there are 5 fathoms; then 6, 5, and 4½, to the River Middle.

§ The *Knock Buoy* is a *black* buoy, lying on the edge of the *West Knock* of the *Maplin*, that extensive bank which forms the Swin. From the Nore Sand Buoy this buoy bears E.N.E. one mile and a half. It lies with the Nore light S. by E. 1¾ miles; Shoebury church N. by E. ½ E.; Land's End of Sheppey a ship's length open to the eastward of the Nore light vessel; and Minster church a sloop's length to the westward of the westernmost round of Sheppey Cliff. The edge of the sand, near the buoy, is steep.

The little town of Leigh is two miles and a quarter to the westward of Southend. Its antient church, with a lofty square tower, is conspicuous, being situate on the rising land. It is inhabited chiefly by fishermen, engaged in the oyster trade. On the shore, at less than a mile to the eastward of it, is the *Crowstone* or *London Stone,* which marks the eastern termination of the conservatorial jurisdiction of the city of London, as we have shown in the chart, and in the note, page 1.

Spring Water on Canvey Island.—To those in want of this essential article, it may be important to know that the operation of boring for water, near the sluice-house upon Canvey Island, has recently been attended with a remarkable result. Water was found at 150 feet, and so near to the sea that the workmen were sometimes annoyed by the spray. The supply is so singularly affected by the tide, that it would appear it passes under the bed of the Thames. During high water the well overflows at the rate of several gallons in a minute, but decreases as the tide recedes. Advantage is taken of the overflow to fill a tank, from which the surrounding inhabitants are supplied; at other times it requires the usual means of drawing the water. Notwithstanding the effect of the tide, at no period has the water partaken of a saline quality.

The NORE LIGHT-VESSEL is the first of the kind which was established. It has one lantern only, but displays a light of great brilliancy, which may be seen from every direction. The vessel is painted *red,* with the word Nore in white letters on each side. The height of the lantern above the level of the water is 33 feet, and the light may be seen at ten miles off. During the day a *red* flag is hoisted at the mast-head, and a gong is sounded in foggy weather. The vessel lies with the Garrison Point of Sheerness W.S.W. ¾ W. 3¼ miles; Minster church on with the easternmost part of a triangular field, called *Mizen-hedge,* bearing S.S.W. ¼ W., and Great Wakering church, N.N.E.

The light vessel lies on the eastern extremity, or spit, of the *Nore Sand,* which lies within, and parallel to, the *Nore Middle Ground;* and it is situate at the distance, by water, of 41 miles (47 *statute*) from London Bridge. It is from this point that vessels usually take their departure, both for the North and South Channels in the mouth of the river. Between it and Sheerness is the anchorage commonly called The Nore, and the Bar of Sheerness Harbour, on the shoalest part of which there are 12 and 15 feet at low water.

TIDES *in the* RIVER THAMES.

In the River Thames, the time of flowing and the perpendicular rising of the first tide after the full and change of the moon, are nearly as follow:—At London Bridge, the time is 15 minutes, and at the Docks 10 minutes past two; at Blackwall and Woolwich five minutes past two; at Purfleet, three-quarters past one; at Gravesend, 1½; at Holy Haven, 12¾; and at the Nore, 12½. At London spring tides rise from 17 to 18 feet: at Purfleet nearly 17, at Holy Haven 15, and at the Nore about 14 feet. Allowance must, however, be made for the wind, which frequently affects the tide considerably.

It appears, therefore, that the tide flows at the Nore one hour and three-quarters before it is high water at London Bridge; and after it flows there, by the ground, it runs upward, in the middle of the river, for nearly half an hour; at which time the water, perhaps, has fallen a foot in height. In the same manner it rises one foot before the flood appears to run.*

In this river, as in other winding rivers, the stream passing from one reach to another, does not immediately wind round the point between; but, setting *directly forward,* it first, and with greater force, strikes against the shore which immediately opposes it. The distance to which the stream then runs along the opposing coast, before it acquires the direction of the new channel, depends on the velocity of the stream, the relative width of the river, and the difference in the course or direction of the two reaches. In those parts where the river is narrow, the stream rapid, and the difference in the course considerable,

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* In the above statement the *mean* times are given; for it is to be recollected that the tides in the river vary with every moon; and that, at the London Docks, the times of high water, on full and change, fluctuate between 50 minutes past one, and 30 minutes past two o'clock; or very nearly so.

siderable, the water will strike with violence against the shore lying as above described; when the resistance which it meets with, and the greater elevation thereby occasioned, will be the means of repelling it back toward the opposite side, above or below the point, according to the ebb or flood; and, it appears that this action of the tide, in its ebb and flood, has, in the process of ages, given to the river its present configuration in different reaches.

SHEERNESS.—The Nore Sand, off the eastern end of which the light-vessel is anchored, extends thence about 4 miles N.W. by W. ½ W. Its middle part, lengthwise, is narrow, and dry at low water, with common tides. It is divided into two parts by a narrow swashway, of 3 or 4 feet at low water, which lies with Queenborough Church just open of Sheerness Point.*

The passage into the Medway lies between the *Cant* on the larboard side, and the *Nore* with *Sheerness Middle Ground* on the starboard. The Cant is that extensive flat which extends from the Isle of Sheppey, and which is uncovered to a very considerable distance from shore. *Sheerness Middle Ground* forms the bar of the Medway, and has on its edge a *black buoy,* which, on entering, is to be left on the starboard side. This buoy lies in 2¼ fathoms, and at nearly half-way between the Nore light-vessel and the town, with *Queenborough Church* S.W. ¾ W. a little open to the westward of a large house to the eastward of *Mile Town* (formerly the Swan public-house); the Garrison Point W. ¾ S. one mile and three-quarters; the Nore light-vessel E. by N. one mile and a half: and Queenborough and Mile-Town Mills nearly in a line. At a mile W. ½ S. above the buoy is the anchorage of the *Little Nore.*

The course from the Nore Light to the black buoy on the Middle Ground is W. by S. one mile and a half; thence to Sheerness Point W. ¼ S. a mile and seven-eighths; and into the River S.W. ½ W.

The anchorage at the Nore is either to the eastward or westward of the light, between the bar and the Nore Sand, in from 6 to 9 fathoms. The best marks are Minster church S.S.W. ¾ W., and the Nore Light N. ¾ W.

The anchorage of the Little Nore is at nearly a mile E.N.E. from Sheerness Point, and 2½ miles W. by S. from the Nore light, and lies with Queenborough Church S.W. ½ W., on the west end of the Turf Redoubt, a little to the eastward of the town of Sheerness.

In proceeding from the Great to the Little Nore you will bring Minster Church S.S.W. on the first hollow or depression of land eastward of the westernmost cliff of Sheppey, and should stand toward it until a beacon, within Sheerness Point, appears a short handspike's length open to the northward of a chimney with a white top, in the second buildings to the southward of the Garrison Point at Sheerness. Then steer more to the westward, and when so far advanced as to have Minster Church upon the western declivity of the West Cliff, steer West, northerly, and bring the beacon midway between the first and second buildings to the southward of the Garrison Point. When Queenborough Church comes to the east end of Mile Town, bring the beacon to touch the south side of the first buildings to the southward of the Garrison Point. These marks lead up in the best water, until Queenborough Church bears from the anchorage as above. The common mark for anchoring at the Little Nore is, the outer Lazaretto in Stangate Creek just open of the Garrison Point.

The *Common Roadstead* for ships that ride windbound within the Medway is at *Blackstakes,* or below the west spit of Queenborough Swale, in from 3 to 5 fathoms.

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* Jenkin Swash.—In order to facilitate the navigation through this swash from the Thames to the Medway, a black buoy is laid at the entrance, as noticed in page 19. This buoy is to be left on the larboard or eastern side, when coming in from the northward. At the S.E. end of the Swash there is now a *red buoy,* which was laid down by order of the Trinity-House in 1834, and is to be left on the western or starboard side. The latter, which is red, and marked '*Grain Spit,*' lies in 9 feet at low water, rather more than a mile N. 37½° E. from the Garrison Point of Sheerness, with the Jenkin buoy N. 27½° W. two miles; the Nore light-vessel, S. 82½° E. 2½ miles, and Minster Mill, S. 19½° E. open eastward of the Preventive Station, the width of the station.

Other marks are, a conspicuous clump of trees on the Isle of Sheppey, bearing S. 7° W., and on with a high chimney eastward of Mile Town; and a red tiled barn (with a remarkable tree southward of it,) bearing N. 66° W. and on with two trees, northward of a black-roofed barn on the Isle of Grain.

With the ebb-tide there is a strong eddy within, on the western shore: and at Sheerness another, equally strong, with flood.

Between Sheerness and Queenborough is a shelf of mud, called the *Lapwell* or *Lappell*, which dries at low water. From the town, at the south end of the King's Dock and mast-pond, at Sheerness, is a pier or wharf, which jets out 300 feet westward into the river; there is, also, on the Lappel, a tide-pier, 20 feet wide, and of the elevation of two feet above the oaze, which is attached to the wharf, and runs out 900 feet therefrom, in a western direction from the town, into the river, down to low-water mark.

At Sheerness dock-yard the time of high water, on full and change days, is 12 h. 40 m., and the vertical rise is 14 feet. In the Medway, the flood-stream runs up, *in mid-channel*, from 15 to 20 minutes after high water at Sheerness dock-yard; but at the Nore light-vessel the flood-stream runs up the Thames for half an hour after high water at the dock-yard.

SECTION II.

The SWIN *and* KING'S CHANNEL, *from the* NORE *to the* EAST END *of the* GUNFLEET.

GENERAL DESCRIPTION.

FROM SHEERNESS POINT the coast of Sheppey trends irregularly 6½ miles S.E. to WARDEN POINT, or the *Land's End*. At half-way between are the church, mill, and village, of MINSTER; which, standing on the rising ground, are conspicuous from sea. Warden Point is the most elevated part of the coast; and here the land drops suddenly toward *Shellness*, a low point which terminates the island at three miles more to the S. by E.

The flat called the CANT spreads to a great distance from all the north side of Sheppey Island, and its edge extends five miles E.S.E. ½ E., in a line with the Bar or Middle Ground of Sheerness. On this edge, at 3½ miles S.E. by E. ½ E. from the Nore light-vessel, and at the same distance from the nearest shore, lies a *white buoy*, denoting the proximity of the *Cant-edge Shoals*, several spots of 8, 9, and 10 feet of water, which lie within the buoy.

OAZE-EDGE, &c.—To the E.S.E. ½ E., at the distance of 4½ miles from the Nore light-vessel, lies the western end of a sand called the *Oaze Edge*, which extends, from a red buoy on that end to a white buoy on its eastern end, East, 4½ miles. This sand, which is connected by a narrow flat to the shoal, called *Knock John*, forms the southern boundary of the navigation of the *West-Swin*.

The PASSAGES *of the* WEST-SWIN and of the EAST-SWIN, or KING'S CHANNEL, lie between flats and ridges of sand, the extremities of which are clearly pointed out by buoys, beacons, &c. The nearest lands being low and flat, and the objects on them not clearly distinguishable, unless in the fairest weather.

The **WEST-SWIN** is bounded on its northern and western sides, by the *Maplin Sand* and *Whitaker Flat;* and, on its southern and eastern sides, by the *Flat of the Barrows*, on which lie the shoals called the *Mouse*, with the *West* and the *East Barrow*. Off the northern side of this flat extends the sand, called the *Swin-Middle*, or *Heaps*, the western end of which, distinguished by a black buoy, bounds the north-eastern side of the West-Swin Channel.

The **EAST-SWIN**, or KING'S CHANNEL, is bounded on the northern side by the *Gunfleet Sand;* on its southern side by the *Swin-Middle*, or *Heaps*, and the *Sunk Sand*.

Of the Shoals above-mentioned, the following is a general description.

The MAPLIN is that great flat of sand which stretches off from Shoebury-ness, and to the eastward of the Isle of Foulness. It covers at about an hour and a half of flood. Upon its edges are the black buoy, called *Shoebury-knock buoy;* a beacon, named the *Blacktail;* a buoy, painted black and white in chequers, called *Foulness Spit* or the *Maplin Buoy;* and a standing beacon, called the *Sheers Beacon*. There is also a beacon on the N.E. spit, called that of the *Whitaker*, which appellation is also given to a swashway at the back, or north side, of the sand.

Off the Ridge, or north side of the Maplin Sand, lies the sand called the BUXEY, which is covered at about 3¾ hours' flood, and forms the north side of the Whitaker Swash. This sand has a buoy at each end, and is about 5 miles in length.

THE GUNFLEET is that extensive sand which lies to the eastward of the Buxey. The whole extent of this sand, from the *New Spitway*, or Swash, between it and the Buxey, is 12½ miles. It trends nearly E. ¼ N., 7½ miles, to a beacon, which stands on its elbow or hook; and thence to a black beacon-buoy, upon its eastern extremity, E.N.E. ¾ E. 3 miles, and N.E. by E. 2 miles. Nearly midway between the Spitway and beacon is a buoy, red and white striped, which is noticed hereafter. A considerable extent of this sand, at the back of the beacon, is called the *East-Knock*, and is not covered till about 2½ hours' flood; to the westward of this there are other patches, dry at low spring-tides; and near the N.W. extremity of it is the *West-Knock*, covered only from about two hours' flood.

THE MOUSE is now considered as merely the extremity of the WEST BARROW, the first dangerous shoal on the SOUTH SIDE of the WEST-SWIN. It has a black buoy, with a staff and ball, on its western end.

The WEST BARROW is a sand covered at about 2½ hours' flood. It extends in an E. by N. and E. direction, nearly 4½ miles from the Mouse Buoy, and is three-quarters of a mile in breadth. On its northern edge or elbow is a *white* buoy, two miles E.N.E. ¼ E. from the Mouse Buoy. From the north-eastern part of this shoal, the western edge of the Flat of the Barrows extends nearly N.E. 4½ miles to its northern edge, which forms the south side of a channel between it and the Swin-Middle, called the *Middle Deeps*.

SWIN-MIDDLE, or HEAPS.—This sand lies in a curve, at about one mile to the northward of the Flat of the Barrows, already noticed. Its extremities are marked by three buoys: viz, a *black* one on the western end: a *black and white chequered* one on the hook or elbow; and a large *white one*, with a *staff and ball*, on the eastern end. The bearing and distance between the west end and hook are, E. by N. ½ N., 2¾ miles: and from the hook to the east end they are E. ½ S., 3¼ miles. The breadth of the sand is one-third of a mile; and between it and the Barrow Flat, the Channel, or *Middle Deep*, has 8, 9, 6, 5, and 7, fathoms.

FLOATING LIGHT of the SWIN-MIDDLE.—At 4½ miles N.E. by E. easterly from the Sheers beacon is a light-vessel, first placed in January, 1837. This vessel, which is painted red, exhibits one brilliant light at 36 feet above the water, and during the day it is distinguished by a red ball at the mast-head, which is taken down in the event of her driving from her station.

From the light-vessel, the Middle Buoy (black) bears E.S.E. ¼ E. about one-third of a mile; the Whitaker beacon N. ¼ E. three quarters of a mile; the Whitaker buoy, (red) N.E. ¾ N., one mile and a half; and the Hook of the Middle or Elbow buoy, (chequered black and white) E.N.E. ½ E. three miles.

The BARROW KNOLL, or EAST BARROW HEAD, lies at the distance of a mile and a half, S.E. by E., from the black buoy on the west end of the Swin-Middle. It is nearly a mile in extent, and is covered at about one hour and a quarter of the flood.

The FLAT OF THE BARROWS, from the Mouse Buoy, on its western point, to its eastern extremity, at E. by N. ½ N., is 13½ miles in length. Its depths are variable, from four fathoms to one: but several parts are dry at low water. The greatest breadth is about 3¼ miles.

The SUNK is a long bank, hitherto very imperfectly described. It is, in fact, a continuation of the flat containing the shoal called the Oaze-Edge, already described, and winds to the N.E. along the back of the Barrow Flat, at the distance of from one to two miles, and so continues until it terminates to the south-eastward of the Gunfleet Sand at the distance of 5½ miles S. E. by E. ½ E. from the Gunfleet Beacon.

Upon this bank there are twelve knolls, dry at low ebbs, the westernmost of which called *Knock-John*, lies five miles E.S.E. ½ E. from the buoy of the Mouse.

At nearly two miles N.E. from the eastern extremity of the Sunk is placed a light-vessel, described hereafter, which is of the greatest importance to the safe navigating of the King's Channel.

2.—DESCRIPTION *of the* BUOYS *and* BEACONS, *with their* Marks, *and the* Side *upon which they are to be kept in Sailing from the* Nore *Eastward.*

CANT BUOY.—On the edge of the Cant Sand, as above explained; *white*, in 4 fathoms on the starboard side. *Marks.*—Shottenden Windmill* just open of the high land of Sheppey Island, bearing S. by W. ¾ W.; the Nore light-vessel N.W. by W. ¼ W. 3¼ miles; and the west buoy of the Oaze-Edge, next mentioned, E. by N. one mile and a half.

Buoy *on the* West end *of the* Oaze-Edge.—*Red*, in 3 fathoms, starboard. The Nore light W.N.W. ½ W. nearly 4¾ miles; Shottenden Mill exactly midway between the two Muscle Houses near Shellness, on the eastern part of Sheppey, bearing S.S.W. ½ W.; and the Black-tail beacon, N. by E. ¾ E. 2⅓ miles. The sand extends hence as already described.

Black Tail Beacon.

Black-tail Beacon, on the larboard side, upon the Maplin. *Marks.*—The Nore light-vessel, W. ¾ S. 5½ miles; Warden Point, or the Land's End of Sheppey Island, S.W. by S.; the Red Buoy at the West end of the Oaze-Edge, S.S.W.; Canewdon church tower touching the west end of the buildings of Havengore Farm, N.N.W. ¾ W.; the Mouse Buoy, E.S.E. ½ E. 2¾ miles; and the Maplin or Foulness Spit Buoy, E. ¾ N. 3 miles. The sand here is dry at low water, spring-tides.

Buoy *on the* West End *of the* Mouse.—*Black* buoy, with staff and ball, nearly 8 miles East from the Nore Light in 4 fathoms, and to be left on the starboard side. *Marks*—The Black-tail beacon W.N.W. ½ W. 2½ miles; Canewdon church on with a small house in Foulness Island, N.W. ½ N.; and the West Buoy of the Oaze-Edge, W.S.W. 3¾ miles.

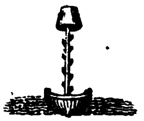
Maplin *or* Foulness Spit Buoy; *chequered black and white*, in 2¾ fathoms, larboard. *Marks.*—Canewdon church, N.W. ¼ W., and a boat's length open to the eastward of a house with three low chimneys; the Mouse Buoy, S.S.W. ¾ W. one mile and a half; the Black-tail beacon, W. ¾ S. 3¼ miles; the Sheers or Horns Beacon, E.N.E. ¾ E. 2⅜ miles; and Minster church, in Sheppey, W.S.W. At 1½ cable's length south of the buoy, there are 10 fathoms, at low spring ebbs.

West-Barrows, Elbow Buoy.—*White*, in 6½ fathoms, on the starboard side, at 2¼ miles from the buoy of the Mouse. *Marks.*—The Mouse Buoy W.S.W. ¼ W. and just clear of the north side of the sand, where it dries at the water's edge; the Black-tail beacon W. ¼ S.; the Maplin buoy N.W. by W. ½ W.; the Maplin or Sheers beacon N. 38° E. one mile and a half. At three ships' lengths to the northward of the buoy are 10 fathoms of water, and the dry edge of the eastern spit of the sand bears S.S.E. a little more than a cable's length from it.

Maplin Beacon, (otherwise the Sheers or Horns Beacon,) on the Spit of the Maplin, larboard. This beacon, erected in May, 1836, stands on the outer edge of the Maplin Sand, with the Maplin buoy, *(chequered)* S. 78° W., 2⅜ miles; the West Barrows buoy *(white)* S. 38° W.; and the Whitaker beacon N.E., 5 miles distant.

Floating Light of the Swin Middle,—off the west end of the Middle Sand, in 4 fathoms, starboard, as described in the preceding page.

Buoy *of the* Swin Middle.—*Black*, in 3 fathoms, starboard. *Marks.*—The Maplin or Sheers Beacon, S.W. ¾ W. 4¾ miles; the Whitaker Beacon N. by W., westerly, one mile; the red buoy on the Whitaker, N.E. by N. one mile and a half.



Whitaker Beacon, in 4 feet, on the Whitaker Flat, larboard. *Marks.*—The Maplin Beacon S.W., five miles; the west buoy of the Middle, S. by E., easterly, one mile; the Whitaker buoy *(red)* E. by N., one mile and one-tenth; Canewdon or Canvidon church W. by N., northerly; the Ridge Buoy *(red)* W.N.W.; a small white house open to the eastward of Bradwell chapel, twice the breadth of the

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* Shottenden Mill; *reported* to be taken down in 1829, has been repaired. The mill in a line with Shellness, the S.E. point of Sheppey, bears S.S.W. ¾ W. The distance between is 6¾ miles.

chapel

hapel N.N.W. ¾ W.; Brightlingsea church tower, twice its breadth open to the westward of the white mansion, N. ½ E.; Great Holland church N.E. ¼ E. The beacon was thus placed in June, 1829. At 160 fathoms outside it is a depth of 3 fathoms at low water.

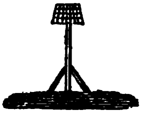
WHITAKER BUOY, on the Whitaker Flat, larboard. This buoy is *red*, and lies in 3 fathoms, with the Whitaker beacon W. by S. one mile and a tenth; the small building at the entrance of Maldon River, called St. Peter's or Bradwell chapel, N.W. ½ N.; and the black buoy on the west end of the Middle, S.W. by S. one mile and a half (1830).

SWIN BUOY OF THE SPITWAY.—*Black*, in 2½ fathoms, on the larboard side, with a cupola on one of the buildings at St. Osyth's on with the eastern side of a martello tower, bearing nearly north; and the Whitaker buoy S.W. one mile and three quarters.*

HOOK *of the* MIDDLE OR ELBOW BUOY.—*Chequered black and white*, in 3 fathoms, starboard. *Marks.*—The Whitaker beacon W. ¾ N. 3 miles; Whitaker buoy (*red*) W.N.W. ¾ W., one mile and three quarters; the West buoy of the Middle W.S.W. ¾ W. 2½ miles; the beacon-buoy of the Heaps E. by S. southerly, 3¼ miles.

BUOY *of the* HEAPS.—*A large white buoy*, with a *staff and ball*, 3 fathoms, starboard. *Marks.*—The Naze Tower N.N.E. ½ E., Great Holland church N. by E., the Whitaker buoy W.N.W. ½ W., and the Sunk light vessel E. by N. 10 miles distant.

S.W. GUNFLEET BUOY.—This buoy is striped red and white, marked *S.W. Gunfleet*, and lies in 3½ fathoms, about 4 miles E. ½ N. from the Swin Spitway buoy, and nearly at the same distance to the westward of the Gunfleet beacon, with Great Holland church N. by E. ½ E.; Naze Tower N.E. ¾ N.; Gunfleet beacon E. ¾ N.; Spitway buoy W. ½ S.; Heaps' beacon-buoy S. ¾ E.; and Western Martello tower on Eastness, N.W. ½ N.



GUN-FLEET BEACON, on the Gunfleet Sand, larboard. *Marks.*—The Naze Tower N. 8° E.; the beacon-buoy of the Heaps S.W. ½ W. 5 miles the S.W. Gunfleet buoy W. ½ S., 3¾ miles; and the Swin buoy of the Spitway W. ¼ S., 7½ miles. (1836.) On the edge of the sand, upon the *Hook*, at some distance without the beacon, is a red buoy.

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* SPITWAY to the COLNE, &c.—At seven-eighths of a mile N. by W. ½ W. from the Swin buoy is the Wallet buoy of the Spitway, *red, with staff and ball*, which lies in 3 fathoms, with the Naze Tower bearing N.E. by E., and Brightlingsea church just open to the right of a three-ridged roof low building, N. ¾ W.

The course through the Spitway is N. by W. ½ W. 2½ miles, leaving its two buoys on the eastern or starboard side; and thence to the entrance of Maldon River, N.W. At the latter two buoys were placed in 1816. The southern one, *white*, on the east end of the Knoll, in 2 fathoms; the other, *black*, on the S.E. end of the Eagle, in the same depth, at half a mile from it, bearing N. ½ E. The channel-way, or entrance, is between these buoys.

The white buoy on the east end of the Knoll, lies with Barn-hall two ship's lengths open of the west point of Mersey Island, N.W. ½ N.; Brightlingsea church on with the White house, called My Lady's House, N. ½ E.; St. Osyth church, on the middle of the Eagle Hedge, N.E. by N.; North Spitway buoy, S.E.

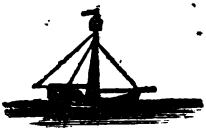
The black buoy on the S.E. end of the Eagle, lies with Barn-hall a ship's length open of the west end of Mersey Island, N.W. ¼ W.; Brightlingsea church and My Lady's House in one; white buoy on the Knoll, S. ½ W.; St. Osyth church, on the middle of Eagle Hedge; the S.W. sand E. by N.

A red buoy has since been placed on Colne Bar Head, in 3 fathoms; bearing from the Eagle buoy N.W. by N. and from the Knoll buoy N. by W. ½ W. It lies with Little Holland Cliff, just open of Eastness point, E. ½ N.; and Brightlingsea church on with the west and highest part of Brightlingsea wood, N. ¾ E.

At about one-third of a mile W.N.W. ½ W. from the Swin buoy of the Spitway, a *white* buoy was placed in 1819, to mark the situation of a wreck, upon the east end of the Buxey, which has since been continued as a permanent buoy.

In August, 1829, a *green buoy* was placed near the wreck of a Humber keel, on the *Flat of the Eagle*, at three-quarters of a mile East from the buoy, with the first tower below Colne Point on with the west end of a grove near St. Osyth, N.E. by N. This buoy lay here in 1836, and had, several times, in hazy weather, been mistaken for the black buoy of the Eagle.

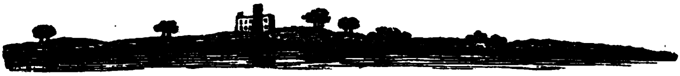
From the Spitway, as above-mentioned, the course to and over the Bar, between the Eagle and Knoll, is N.W., which will lead to a berth off the red buoy on the Colne Bar Head; and, leaving this buoy on the east or starboard hand, the course into the Colne, in the best water, will be North: or, up to the West Mersea N.W. ½ W.



Sunk Light Vessel, at nearly two miles N.E. from the eastern end of the Sunk, in 8 fathoms, starboard. *Marks.*—Gunfleet beacon W. by N. 5¾ miles; the Long Sand Head buoy (*black*) S.E. ¼ E., 4½ miles; N.E. buoy of the Gunfleet N.N.W. ¼ W., 3¼ miles; the N.E. side of Walton hall touching the S.W. side of the Naze tower, N.W. by N.; Harwich high-light, N. by W. ¼ W.; buoy on the S.E. Spit of the West Rocks, N. by E., 4½ miles; buoy on the Rough (*red*) N.N.E. 7½ miles; S.W. buoy of the Shipwash (*white*) N.E. ½ E. 7 miles.

The vessel exhibits *one brilliant light*, at 30 feet above the sea, which may be seen at three leagues off.

East End *of the* **Gunfleet**, a *black* beacon-buoy, with a staff and ball, laid down in 1826, in 4 fathoms; larboard side. *Marks*—The Naze Tower and Walton Hall (a white building farther in-land) on with each other, bearing N.W. ½ N. The Gunfleet beacon, W.S.W. 4¾ miles. Harwich lights nearly N. by W., and the Sunk light S.S.E. 3¼ miles distant.



Naze Tower and Walton Hall in one.
(The top of the Tower is 138 feet above the level of high water.)

3.—DIRECTIONS *for* SAILING *from the* NORE *through the* SWIN *and* KING'S CHANNEL.

The direct course and distance from half a mile north of the Nore light to half a mile south of the Blacktail Beacon are, E. ¼ S. 5¼ miles; and thence to a fair-way between the buoy of the Mouse, on the starboard, and that of Foulness Spit, or of the Maplin, on the larboard, the course and distance will be E. ½ N. 3¼ miles.

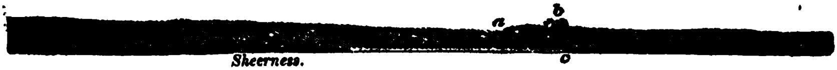
Allowance, in these courses, must be made for the tide; noting that the ebb sets to the S.E. and E.; and caution must be observed in approaching the Maplin on the north side. But observe, when between the Nore and Blacktail Hole, that in turning you do not stand far to the northward of the Warp, until you are nearly as low as the Blacktail, as the Maplin sand is steep-to.

Hollyhill trees, commonly called the Kettle-bottom trees, which stand above Chatham, are a very useful mark in sailing to the West Swin. They are distinguished by the letter *b*, in the view annexed, wherein *e* represents the point of Sheerness; *c*, the left-hand end of the Blue Town; *a*, Chatham valley; and *d*, the Isle of Grain.

This mark leads just clear of the west end of the Oaze-Edge: Hollyhill trees *(b)* being about their apparent length on upon the left-hand end of the Blue Town *(c)*; or Chatham valley *(a)*, nearly on with the left-hand end of the Blue town, leads just clear of the Oaze-Edge west end.

Line-of-battle ships need not stand nearer to the Oaze-Edge than to have Hollyhill trees on with the right-hand end of the Blue Town; or a little more than midway between the right-hand end of Sheerness and the left-hand end of the Blue Town; or, to have Chatham valley a little way on upon the left-hand end of the Blue Town.

The right-hand end of Hollyhill trees *(b)* as shown in the following view, on with the left-hand end of Grain Isle Wood *(c)*, or Chatham valley *(a)*, a little more than twice the apparent length of Hollyhill trees open to the left of Grain Isle Wood, leads just clear of the Knock Spit.



Line-of-battle ships need not stand nearer to the Knock Spit of the Maplin (a mile westward of the Blacktail) than to have Hollyhill trees about their apparent length open to the left of Grain Isle Wood; or Chatham valley about one-third part of the apparent distance between Sheerness and Grain Isle to the left of Grain Isle Wood.

From the depth of 6 and 7 fathoms northward of the Nore light, there are 8 and 7 to 10 fathoms off the Blacktail, and thence from 8 to 10 fathoms to the Maplin or Foulness Spit Buoy, where the depth increases.

When as low as the Blacktail, should the wind or tide prevent your going through the Swin, you may come to an anchor in *Black-tail Hole*, in 8 or 9 fathoms at low water; the Nore light bearing W. ¼ S. 5½ miles.

From the Mid-Channel, between the Buoy of the Mouse and the Maplin Buoy, to a proper berth without the Sheers or Horns-Beacon, the course and distance are E.N.E. ½ E. 3½ miles; and from off the Sheers to the mid-channel, between the western buoy of the Swin-Middle and the Whitaker beacon, N.E. ½ N., 4¾ miles. Due allowance, however, to be made for the tide, which sets strongly; the flood in a true S.W. direction.

Between the Sheers Beacon and the West end of the Middle, there is an excellent roadstead in every part, for ships in general, with 6 fathoms every where, from the beacon to within a mile above the buoy of the Middle.

It is to be observed that vessels, working down in this part, should stand toward the Maplin Sand into only 4 or 5 fathoms, putting about when in 8 or 9 fathoms to the southward, in order to avoid the Barrow Flat. Be careful, also, of not getting to the southward of the Middle; as the tide sets with great strength between it and the Barrows, through the *Middle Deeps*.* Here the bearings of the Light vessel will be found particularly useful; the direct course toward which is N.E. ½ N.

The CHANNEL *between the* WHITAKER *and the* Swin Middle light-vessel is narrower than it was formerly described; it being, with a depth of 5 and 6 fathoms, little more than half a mile in breadth. The course and distance from off the black buoy to the *Elbow*, or chequered buoy on the Hook, are E.N.E. ½ E. 2¾ miles; and thence to the Gunfleet Beacon E. by N. 7¾ miles.

Between the beacon buoy on the Heaps and the S.W. Gunfleet Buoy is the *Middle Ground*, of 5 to 6½ fathoms. In the night you may easily know when you are to the northward of this bank by finding a sticky bottom, while to the southward of it you have sandy ground.

Between the West Middle and Whitaker Flats the depth is generally 7 fathoms: between the Heaps and Gunfleet 6 to 8 fathoms.

From the Gunfleet Beacon to the black beacon-buoy on the extremity of the Gunfleet Sand, the courses and distances are E. by N. 2 miles, and N.E. by E. ¼ E. 3 miles.

At the distance of two miles below the Spitway, it is not safe to approach nearer to the Gunfleet than in 8 or 7 fathoms; when you should put about. Be cautious, likewise, of standing too near to the Heaps. Hereabout the striped red and white buoy on the Gunfleet may be seen, and will be found useful. It lies, as already shown, (on page 25,) about 4 miles E. ½ N. from the buoy of the Swin Spitway.

With the white beacon-buoy on the eastern end of the Heaps S.S.E. ½ E. and the Whitaker buoy W. ¼ N., there is a patch of four fathoms. At the distance of a mile to the W. by N. of this is a narrow bank of 5¼ fathoms. These appear to be the remains of a middle ground, which formerly existed between the Heaps and Gunfleet. In all other parts of this channel the soundings approach more to an equality than formerly, and the shoals are consequently less steep, but the depths still vary from 7, 6, 8, and 5, to 10, 12, and 13, fathoms, at low water spring-tides.

The floating light off the east end of the Sunk is an excellent guide for the rest of this channel, especially in the night. It may be approached, with the greatest safety, when bearing East, or E. by N., to 11, 10, or 9, fathoms; as it lies in 8 fathoms, nearly two miles N.E. from the Sunk Head.

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* The *Middle Deeps* now form a channel 6 miles in length, and have throughout from 8 to 7, 6, and 5, fathoms.

Should you arrive at the beacon-buoy of the Gunfleet Head at low water, with the wind from the N.E., it may be best to run in, to the back of that Sand, through Goldmer's Gat, into the Wallet, where you may come to an anchor, as hereafter described, in 6 or 7 fathoms, with Walton Hall, a remarkable house upon the Naze, *described on page* 26, a sail's breadth open to the westward of the Naze Tower.

TIDES *in the* SWIN *and* KING'S CHANNEL.

The flood-tide sets upward, through the King's Channel and Swin, into the Thames, nearly in the direction of the several shoals which have been described. The flood, in the first two hours sets with great velocity between the Long Sand and Sunk. The ebb in a contrary direction, according to its strength and that of the wind. Through the Swin and King's channel the tide sets with considerable strength, especially in the West Swin, between the Mouse and the Maplin. It also sets strongly through between the Middle or Heaps and the Barrow Flats.

The ebb sets strongly and diagonally across the Mouse and West Barrows. In proceeding downward be careful that the ebb does not set you aground between the Mouse and the West Barrows. Indeed it is of consequence to be attentive to the tides in every part of this navigation.

The flood tide sets W.S.W. and ebb E.N.E.; and in a great degree, runs in an oblique direction over all the sands and shoals between the N.E. buoy of the Shipwash and the Gunfleet.

On the days of fall and change, it is high water in the King's Channel at 12 o'clock, and the highest tide rises about 16 feet; neaps 10 feet. At the Nore, it is high water at half past 12, and the rise is 14 feet. Allowance must, in all cases, be made for the wind; as, with an easterly wind, the tide flows sooner; and with an opposite one, the contrary.

In the channel on the west of the red buoy on the west end of the Oaze, in that between the West Barrow and Maplin, in that between the buoys of the Middle and Whitaker, and in the West Spitway, the stream turns, or alters its direction, at 20 minutes past 12; at about half way between the east end of the Gunfleet and Harwich Naze, at 10 minutes past 12: and at about two miles S.S.W. from the same end of the Gunfleet, at 12 o'clock.

In the Inlets, or Rivers, the tide flows and rises as follow: Burnham River and Kay, Maldon River, entrance, and Colchester river, at 12h. 0m.; rise, 14 feet. At Maldon Kay an hour later, and there the rise is only 6½ feet.

SECTION III.

KING'S CHANNEL *and* SHIPWAY *to* ORFORDNESS, *and thence to* HARWICH HARBOUR.

KING'S CHANNEL *to* ORFORDNESS.

1.—DESCRIPTION OF THE SHOALS, BUOYS, BEACONS, &c.

The SUNK SAND is narrow and steep-to on both sides, extending about E.N.E. and W.S.W. *(or rather more easterly)*; a considerable portion, as already shown, is dry at low ebbs. The light-vessel, noticed on page 26, is placed at nearly two miles N.E. from the east end of this sand; it exhibits one brilliant light in the night, and a red flag at the mast head during the day; in foggy weather, a gong is struck six times in every ten minutes, to distinguish this from other vessels.

For the marks and bearings from the light-vessel, see page 26.

In working between the Sunk and the Gunfleet, stand no nearer to the Sunk than with the light bearing E. by N. The east buoy of the Heaps (*white with a ball*) bears from the light W. by S. 10 miles.

The WEST ROCKS form an extensive and dangerous range, of which the eastern part lies 2½ miles N.E. ½ E., or rather more easterly, from the east buoy of the Gunfleet. Some parts are nearly dry at low water; but the soundings in other parts vary from 1 to 4 fathoms. The range is 2 miles in breadth in a line N.E. by E. and S.W. by W., and extends outward 5½ miles from the Naze.

The East spit of these Rocks is distinguished by a buoy, chequered *black* and *white*, with the words West-Rocks thereon. It lies in 3¾ fathoms, with the Gunfleet beacon-buoy S.W. ½ W. 2$\frac{7}{10}$ miles; the Sunk-light, S. by W. 4½ miles: the buoy of the Ruff, N.E. ½ E. 2$\frac{8}{10}$ miles; the buoy on the S.W. end of the Shipwash, E. ½ S. 4¾ miles; the Sea-mark on Bawdsey Cliff, N. by E. ¼ E. 8½ miles; and the Naze Tower, W.N.W. ¼ W. 6$\frac{1}{10}$ miles.

The CORK SAND and LEDGE.—Nearly N. ½ W. 3¼ miles from the East Spit of the West Rocks, lies the eastern part of the Cork sand, a considerable part of which is dry at low water. From this to the reef called the Cork-Ledge, the bearing and distance are N.W. by N. one mile.

A white buoy with a *staff and ball*, is laid down on the Cork-Ledge, with Cork-Ledge marked thereon. It lies to the northward of the shoalest part of this Knoll (on which is about 9 feet) in two fathoms, with the following marks, &c.

1. The Tower of Harwich church, about N.W. ½ W., distant 4$\frac{1}{10}$ miles, and seen midway in the opening between the high buildings in Landguard fort and the Martello Tower to the right of the fort. 2. Bawdsey church, N.E. by N., distant 5 miles.

The CORK KNOT is a rocky shoal, of 19 and 20 feet, lying one mile and a half east from the Cork Ledge, to which it appears to be connected. Its outer extremity lies N. by E. four miles from the buoy on the East Spit of the West Rocks.

The ROUGH or RUFF.—This is a reef of three fathoms, extending two miles N.N.W. and S.S.E. Its eastern side is distinguished by a *red buoy*, which lies in 3½ fathoms, with the following marks: the buoy on the East Spit of the West Rocks, S.W. ½ W. 2$\frac{8}{10}$ miles; the Sunk-light, S.S.W. ½ W., 7 miles; buoy on the S.W. end of the Ship-wash (*white*) S.E. by E. 3 miles; buoy on the South part of Bawdsey Sand, N.E. by N. 4$\frac{1}{10}$ miles; and Bawdsey church N. ¼ E. open to the left of Bawdsey beacon or Seamark; distance from the latter, 6½ miles.*

The UPPER or WEST ROUGH.—This is a rocky shoal, similar to the Rough, which has on its shoalest part 2½ fathoms. It extends in the same direction as the Rough, nearly mid-way between it and the West Rocks. The S.E. extremity lies with Arwerton church on the S.W. part of Landguard Fort, and Bawdsey church open N. ¾ E. open to the left of Bawdsey beacon.

The SHIPWASH is a very narrow ridge of sand, forming the S.E. side of the Shipway, and extending about N.E. and S.W. 7½ miles. Some parts of it are said to dry in low ebbs, and it is steep-to on both sides. This is a dangerous bank, as ships coming in from sea have not sufficient warning, by the lead, in approaching it.

A white buoy with a *staff and ball*, is placed at the S.W. end of this sand, from which the Sunk-light bears S.W. ½ W. 7 miles; the beacon buoy on the Gunfleet W. by S. 7¼ miles; the buoy on the Rough, (*red*) N.W. by W. 3 miles; the chequered buoy on the Bawdsey Sand, N. 4¾ miles.

The N.E. end of the Shipwash bears from the high light of Orfordness, S. ½ E. 4¾ miles. A *Light-vessel*, similar to that of the Swin Middle, described in page 23, was placed near it in January, 1837, in 4¾ fathoms, with the N.E. Bawdsey buoy bearing W.N.W. ¼ W.,

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* The old Sea-mark on Bawdsey Cliff having fallen down, in September, 1830, a new Beacon, built of brick, was erected in lieu of it. This beacon is erected on a site S. 3° E. from Bawdsey church tower, and about 3460 feet distant therefrom; about 1200 feet N.E. from the situation of the former beacon, and 230 feet from the edge of the cliff.

During the building of the beacon, Bawdsey church kept open to the eastward of Dr. Page's house, was used as a sufficient mark to lead vessels to the eastward of the Rough, &c.

Bawdsey church W.N.W. ½ W., and Orfordness high lighthouse N. ½ W., as expressed above. The object of this Light-vessel particularly is, to enable ships of great draught of water to proceed with safety through the channel between Bawdsey Sand and the Shipwash, instead of going into Hosley Bay. In sailing along the Shipwash, care must be taken to give an allowance in the course for the set of the tide, the flood setting about W.S.W., and the ebb E.N.E., which thwart this sand about two points.

BAWDSEY SAND, forming the N.W. side of the SHIPWAY, is about 4 miles in length, and three-quarters in breadth near the S.W. end. The soundings are very irregular upon the shoal; we have not found less than 10 feet at low water, spring tides, any where upon it; but from the unevenness of the ground, there may be knolls with less water. Upon the S.W. part of the shoal, *a white and black chequered buoy* is placed, from which the high-light of Orfordness bears N.E. ¼ N. 7½ miles, Hosley church N. by W.; Bawdsey beacon, N.W. by N. 3¾ miles: the buoy of the Rough, S.W. by S. 4⅒ miles; the Sunk light, S.S.W. ½ W. 11 miles.

The N.E. end of Bawdsey Sand, called the *Baldhead*, lies with Orford high-light N.N.E. 4 miles. It is distinguished by a *black buoy*, lying in 5 fathoms, with Aldbro' church well open to the eastward of Orfordness beach, N.N.E. ½ E.; Bawdsey church open twice its width to the westward of the second tower below Bawdsey cliff, W.N.W.; the Shipwash light-vessel S.E. by E. ¾ E., two miles; the N.E. Whiting buoy N. by E. ½ E., 2¼ miles; Bawdsey Beacon W.N.W. ½ W.; and Orfordness high-light N.N.E.

This sand now extends more to the N.E. than formerly; and Orford low-light with Aldborough Mill in a line, bearing N.N.E. ¾ E., leads over the N.E. end in 3½ fathoms.

The KETTLE-BOTTOM is a shoal of a serpentine shape, extending nearly two miles N.N.E. ¼ E. from the S.E. or chequered buoy on Bawdsey Sand. It lies within, or to the northward of, the south part of Bawdsey Sand, and its least depth is about 2 fathoms, with uneven and irregular soundings.

The CUTLER, which lies off Bawdsey Cliff, is a rocky shoal, with uneven soundings. The lights of Orfordness in one lead over its outer edge in two fathoms. In consequence, a *black buoy* was placed on its southern extremity in 1810, which lies in 4½ fathoms, with Bawdsey church on with a white house seen over Bawdsey Cliff, bearing N. ½ E., and Orfordness low-light a little open to the southward of the high-light.

The MIDDLE GROUND, in HOSLEY BAY.—This is the ground, or flat, that extends from off the entrance of Orford or Aldborough Haven toward Orfordness, on the N.W. side of Hosley Bay. *The black buoys, as no longer requisite, have been taken up.*

The WHITING is the narrow bank, forming the southern side of the channel-way of Hosley Bay. Its N.E. end lies not a mile distant from the beach, with Orford church bearing N. ½ W. The shoal extends thence S.W. by W. ¼ W. 3 miles. The light-houses on Orfordness in one lead close upon the inner edge of this sand: therefore, in working through Hosley Bay, the lower or easternmost light must be kept in sight to the northward of the high-light.

The extremities of the Whiting are now marked out by *three white buoys*. The first buoy is on the S.W. end, and lies in 3¼ fathoms, with a white mill in the country a little open to the westward of a white house, and entering on a grove of trees, bearing N. ¼ W., a Martello Tower to the westward of Bawdsey Point, shutting in with the point; and the low-light a little open to the southward of the high-light.

The second buoy is on the *elbow* or innermost edge of the sand, in three fathoms, 2¼ miles from the S.W. buoy, and lies with Orfordness light-houses in one, bearing N.E. by E.; and Orford Castle N. by E., with a white mill a little open to the westward of it.

The third buoy, with a *staff and ball*, is on the N.E. end, within the distance of a mile from the beach, with Orford church bearing N. by W., and the high-light N.E. ¼ N.

FLAGSTONE.—Between the southern part of the Whiting and the entrance of Orford Haven, there is a rocky tract, of a mile and a quarter, called the *Flagstone*. It lies half a mile from the Whiting, and parallel thereto. The least depth on it is 5 fathoms.

SHOALS without ORFORDNESS.—The SHOALS at Orfordness and its vicinity, to the northward, are, the *Onion*, *Nathaniel's Knoll*, the *Ridge*, *Aldborough Knapes*, and *Sizewell Bank*. Of these, the first, namely, the *Onion*, is a shelf which stretches to the distance of a cable's length from the ness or point. *Nathaniel's Knoll*, is a continuation of the Onion, and the Ridge may be considered as a farther continuation;

all having grown up within a few years, and the whole extent is now about a league, in the direction of N.E. by E.

On the outer edge of NATHANIEL'S KNOLL, in 3½ fathoms is a black buoy, with the words *Nathaniel's Knoll*, which was first laid down in June, 1826. The name of the shoal is painted on the head of the buoy. From the place of the buoy the low-light on Orfordness bears W. ½ N., about two-thirds of a mile; the N.E. buoy on the Whiting S.W. by W. ¼ W.; a black buoy on the Ridge N.E. by E. ¼ E. a mile and three-quarters; and a windmill open to the right of the chancel part of Aldborough church, N. by E. ¾ E. Near to and within the buoy are only 7 feet at low water.

The RIDGE is a sand forming a long oval, and there is *at present*, a swash of 3½ and 4 fathoms, between it and Nathaniel's Knoll; the black buoy on its edge, above-mentioned, lies in 4 fathoms, with the following bearings: Orford church and castle just open of each other, west; Orfordness high-light W.S.W.; and Snape church to the left of a Martello tower near Slauden-house, N.N.W. ¾ W.

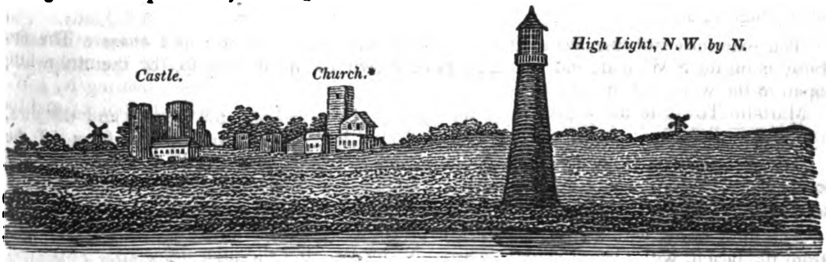
ALDBOROUGH KNAPES, a shoal of 2 and 3 fathoms at low water, extends nearly N.E. and S.W. from the depth of 5 fathoms at each end, 2½ miles. Its N.E. end lies with Aldborough church W.N.W. ½ W. 4 miles, and Orford low-light W.S.W. ½ W. 6¼ miles. Its S.W. end lies with the same church N.W. by N. 3¾ miles; and Orford low-light W. ¼ S. 4 miles. The sand is one quarter of a mile in breadth, and has 2 fathoms over it, at three-quarters of a mile from its S.W. end, and thence to near its N.E. extremity, 2½, 3, 4, and 4½ fathoms.

Upon the eastern edge of the shoal lies a *chequered black and white buoy*, in 5 fathoms, at common spring-ebbs, and at about 1½ cable's length to the eastward of that part where the sea breaks the highest in easterly gales. The sand is here about 350 fathoms broad: viz., from 5 fathoms on the eastern edge to 5 fathoms on the western. It is steep-to on each side; and, at the distance of about one cable's length, in the direction of E.S.E. from the buoy, there are 10 fathoms; and, at the distance of about two cables, 14.

FROM THE BUOY, Aldborough church bears N.W.; Orford high-light W. ¾ S.; Orford church and castle in one, W. ¼ N.; and Iken church, which has a tower-steeple, nearly N.W. by W., at one-third of the apparent distance from Aldborough town to Slauden-house.

The S.W. end of the Knapes, in 5 fathoms, bears from the buoy, S.W. by W. three-quarters of a mile, and the least depth between is 2¼ fathoms. From the extremity of the shoal, Iken church, N.W. a little westerly, appears about midway between Slauden-house and a Martello tower to the southward of it; while Orford high-lighthouse bears W. ½ S. 4¾ miles.

The N.E. end of the Shoal is nearly two miles N.E. from the buoy, and lies with Aldborough church W.N.W. ½ W. 4 miles, and Leiston church, (tower-steeple) well open to the right of Thorpe-house, N.W. ½ N.


Castle.
Church.*
High Light, N.W. by N.

Appearance of Orford High Light-House, Church, and Castle.*

THE MARK FOR COMING IN FROM SEA, from the northward, between Aldborough Knapes and the Sizewell Bank, described hereafter, is Orfordness lights in one, bearing S.W. by W. ¼ W.; which will lead in a fairway between the Knapes and the shore to the westward. But observe that these lights in one will lead within the *Ridge*, whence you may sail out between that shoal and the Knoll, with Aldborough church N. ½ E. Or, rather, you may run along, eastward of the Ridge, with Aldborough church bearing N.N.W.

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* The church tower, here represented, fell down in the month of May, 1830.

until Bawdsey Cliff is open of the point of Orfordness: then steer a mile and a half S.W. by W. until Bawdsey church comes well open to the left of Orfordness. The last mark leads clear of Nathaniel's Knoll to the southward: but, when abreast of the *Onion*, be careful to keep Bawdsey church still more open of the Ness, in order to avoid that shoal. Hence you round into Hosley Bay, &c.

The Light-houses of Orfordness are built of stone, and are, respectively, 83 and 55 feet in height from the base. The lights are brilliant, fixed, and those of the high tower may be seen, in clear weather, more than seven leagues off.

Off Aldborough you may anchor in good ground, with an off-shore wind, in 6 or 7 fathoms, with Orfordness high-light S.W. by W., and Aldborough church N.W.

Should you be coming in from sea, from the southward, for Orfordness, in the night, with the wind scant to the southward, you may, when within, or to the westward of, the Gabbards, bring the low-light as far to the north as N. by W. which will lead clear of the N.E. end of the Shipwash. Should the wind be to the northward, be cautious of not bringing the light farther to the westward than W. by N. until within Aldborough Knapes.

If, in coming in, you should make the high-light N. by W. ½ W., you may, without danger, if to the northward and a scant wind, bring it West; and if to the southward, N.W. by N.

2.—DIRECTIONS FOR SAILING FROM THE KING'S CHANNEL TO ORFORDNESS, &c.

The SHIPWAY.—Vessels bound outward to the N.E. from the KING'S CHANNEL, may either pass directly from off the Gunfleet buoy to Orfordness, through the SHIPWAY, between the Shipwash and Bawdsey Sands; or hauling round to the northward of the Rough, pursue their course thence to Orfordness, through Hosley Bay.

In the first case, having arrived to the spot whence the east or beacon-buoy of the Gunfleet bears west, and the Sunk-light S.S.W., you have to keep an exact N.E. course for 16 miles; which will lead to a berth 2 miles S.E. by E. of Orfordness low-light. On this N.E. course, at one mile and a half, the *black and white buoy* on the Spit of the West Rocks will be distant about a mile on the larboard hand; at 4 miles you will be nearly midway between the *red buoy* of the Rough, on the larboard, and the *white beacon buoy* on the S.W. end of the Shipwash on the starboard hand: at 8 miles you will have the *chequered buoy* on Bawdsey Sand on the larboard (1½ mile distant): and thence, after passing the *black buoy* on the *Baldhead* or N.E. end of Bawdsey Sand, at 12½ miles, you will be abreast the Light-vessel off the N.E. end of the Shipwash; and may then shape a course to avoid the Knapes, &c., as shown hereafter.

Throughout this navigation, the depths vary from 11 to 8, 6, 7, 9, and 8 fathoms. You must be cautious in approaching the shoals, as they are steep-to; and observe to make sufficient allowance for the tide, which sets as shown in the description of the Shipwash, page 30.

HOSLEY BAY, &c.—*From the Gunfleet beacon-buoy*, the course and distance, in a fairway, for Hosley Bay, are, N.E. by E. ½ E. 3 miles; and hence, from off the East Spit buoy of the West Rocks, a N.E. course, for 3 miles, will lead clear of the Rough. The Sunk-light from this part will bear nearly S.W. by S., and the anchorage in Hosley Bay, N. by E. 6½ miles.

In passing the Rough, known by its red buoy, you will have Bawdsey church and new beacon in a line, bearing N. 3° W., and may run in for the buoy of the Cutler (*black*) in this direction, or rather with the church open to the right of the beacon. From off the buoy of the Cutler to the anchorage in Hosley Bay the course is N.E. ½ N. 3 miles.

Observe, in all cases, to allow for tide, whether flood or ebb; the former setting W.S.W., and the latter, E.N.E. In the tract between the Gunfleet, West Rocks, and Rough, are from 6 to 9, and thence to 6 and 5 fathoms at low ebbs.

In turning to windward, approach no nearer to the West Rocks than till Alderton church comes on with Bawdsey church, on the rising part of the cliff; nor to the west end of the Shipwash than till Bawdsey church comes on with the N.E. end of the long wood to the eastward of Bawdsey Cliff. Or, to the West Rocks, stand no nearer than 5 fathoms, nor to the Shipwash than 8 fathoms.

When past the Rough, stand no nearer to Bawdsey Sand and the Kettle-Bottom than till the tree to the northward of Orford church comes nearly to the west side of that church; nor to the Cork Sand or Knot, than till Harwich-steeple comes on with the Martello tower, standing a little to the northward of Landguard Fort. In the night, approach no nearer than 5 fathoms; or to the Cutler, than 5½ fathoms. Hence, in working into Hosley Bay, stand off to 8, and in, toward shore, to 5 fathoms.

The best anchorage in the southern part of Hosley Bay is, with Hosley church N. by W. ½ W. In the northern part you may anchor between the Hook buoy of the Whiting and the N.E. end of the Middle Ground, in 6 or 7 fathoms, good ground.

ORFORDNESS.—*From the southern anchorage in Hosley Bay*, the course to *Orfordness* is between the Middle Ground on the larboard, and the three white buoys of the Whiting, on the starboard, side. These clearly mark out the channel. From the anchorage, in 6 fathoms, by steering N.E. by E. 2 miles, you will have the leading mark on, which is the lower or easternmost light-house kept open to the northward of the high-light.

With a turning wind, stand no nearer, either way, than in 7 or 8 fathoms; nor to the beach, than 8 or 9 fathoms.

About the Ness the bottom is hard, and there is a depth of 10 fathoms close to it. It is so steep that you may have 8 fathoms at one cast, and before the lead can be hove again, may be ashore; you ought not to approach nearer to it than 12 fathoms. To the westward of the Onion there is a *contra* tide, caused by the point above the Ness. This counter-tide runs down, during the flood, with as much velocity as the tide in the channel runs up. Some ships, by getting into this eddy, have missed stays with a turning wind, and run on shore.

In the fair-way, between Orfordness and the Whiting, are from 10 to 12 fathoms; and, in the narrowest part, 6 to 8 fathoms. Should the buoy be gone, open the black mill to the eastward of the church, and you will have passed the sand.*

If bound out to sea, from Hosley Bay, you may, after passing the N.E. buoy of the Whiting, steer S.E. by E. or East; and, if bound to the northward, keep along shore, observing not to shut Bawdsey Cliff in with the point of Orford Beach, until Dunwich Cliff be open of Thorpness.

ORFORDNESS to SEA.—The mark leading clear of Nathaniel's Knoll and the Ridge is Bawdsey Cliff, bearing W.S.W. ¾ W., kept well open of Orford beach until Aldborough Church bears N.N.W., when you will be about half-way between the black buoy on the Ridge and the S.W. end of Aldborough Knapes. From the last spot, a course N.E. ¾ N. leads clear of Sizewell Bank, &c. To clear the S.W. end of Aldborough Knapes, the mark is, Orford Castle a sail's breadth open to the southward of the church, and bearing W. by N.

FROM ORFORDNESS (latitude 52° 5′, longitude 1° 34¼′ E.) the compass bearings, and distances in miles, to different places, in the North Sea, are as follow:

To Dunkirk, South, 68 miles; Nieuport, S. by E. 70; Ostend, S. by E. ¾ E. 70; West-Cappel, S.E. ½ S. 74; Goeree Gatway, S.E. ¾ E. 86: Camperdown, E. ¾ S. 118; South Entrance of the Texel, East, 124; Naze of Norway, N.E. ¾ E. 398 miles.

3.—HOSLEY BAY *to* HARWICH.—DESCRIPTION AND DIRECTIONS.

HOSLEY BAY *to* HARWICH.—Between Hosley Bay and Harwich Harbour are several dangers not yet described. These are the *Platters*, the *Andrews*, *Ridge*, *Pye Sand*, *Holidays*, *Altar*, &c.

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* In answer to some inquiries as to the state of ORFORD HAVEN, we have received from a friend the following information:—

The harbour and bar are constantly shifting, so that no particular bearing can long be correct.

The best information we can give you, and which may be put down in the directions for coming in, is, that, "whenever the bar shifts, or alters, the beacons are immediately shifted, and the proper mark for coming in is the two beacons in one; vessels bound in will find from 10 to 12 feet at high water, or more.

"There are residents at the haven; and those wishing to come in will have, by hoisting a flag, boats come off, in the day time; and, in the night, by hoisting a light under the bowsprit or over the side."

These shoals are so nearly together, that it is scarcely possible to give an adequate description of them; we are therefore under the necessity of referring the reader to the Chart of the Harbour,* in which the whole will be found, with the several marks.

The first shoal, in sailing from Hosley Bay, is the *Cutler*, already described in page 30, which lies off the middle of Bawdsey Cliff, and is sometimes nearly uncovered at low ebbs.

The *course*, from the lower part of Hosley Bay to abreast of this shoal, is S.W. by W. or S.W., according to the tide; keeping, while within the Whiting, (or until Orford Haven bears N.N.W.) Orfordness lower or easternmost light open to the northward or left of the high-light: and, when above the Whiting, the low-light open to the southward of the high-light, until Harwich Church appears nearly in the middle between Felstow Cliff and Landguard Fort. Observe to stand no nearer to the Cutler than into 5 fathoms. When above the shoal, Ramsholt Church will appear open to the westward of Bawdsey Cliff; with this mark, should the wind be from the N.W., you may haul in toward the land.

The upper lighthouse of Harwich bearing W.N.W. ½ W. leads clear of the Cutler, in 4½ fathoms.

FELIXTOW ROAD and the PITCHING GROUND.—The anchoring ground, called *Felixtow* or *Felstow Road*, lies between the extensive ledges and banks which stretch from Felstow or Bull's Cliff, on the north side, and the Cork Rocks or Reefs on the south side.

The PITCHING GROUND lies within Felstow Road to the Westward; being bounded toward Landguard Point by the shoals called the *Platters* and *Andrews*: and, at the west end, by that called the *Ridge*. Its depths are 4½ and 5 fathoms, and the bottom of mud and sand.

The PLATTERS lie to the S.E. by E. of Landguard Point, and extend nearly a mile from shore. Some part of this danger is nearly dry at low water. The marks leading clear of the outer part are, Orford church and castle a sail's breadth open of Bawdsey Cliff.

The ANDREWS, a shoal, which lies within the Platters, stretches from off the fort-point, nearly half a mile to the S.S.E. from the stony beach. It is, in some part, dry at low water; is steep-to on the west side, and particularly dangerous, as the first half-ebb sets to the eastward strongly over it. Between this shoal and that without, called the Ridge, (next described,) is the usual channel into the harbour.

The RIDGE, which lies to the southward of the Andrews, on the opposite side of the channel to Harwich, is a rocky bank, nearly a mile in length, from S.E. to N.W., and in the middle part, nearly half a mile broad. Its shoalest part has about 5 feet over it, at low ebbs. This part lies with Arwarton steeple N.N.W. ½ W. well on with Harwich Beacon Cliff. From the S.E. end, Landguard Point bears N. ½ W.

HARWICH.—ENTRANCE OF THE HARBOUR.—The edges of the shoals forming the Pitching Ground, or Outer Entrance of Harwich Harbour, are now distinctly marked by four buoys, which were first laid down in 1826. On the north side are two black buoys, upon the edges of the Platters and Andrews; and, on the south side, a chequered and a white one, upon the Ridge. The two inner buoys (*Black and White*) are only one quarter of a mile asunder, and lie a little without the Bar which separates the Pitching from the Rolling Ground.†

Between the Rolling Ground and Harwich are several shoals; viz. the *Altar*, two small stony

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* The New Survey of the coasts of Essex and Suffolk, from the Western Spitway to Orford Haven; including the harbour and environs of Harwich, with the rivers of Ipswich, Woodbridge, &c., on a very large scale, lately published by Mr. Laurie.

† BUOYS, &c.—The four buoys lie as follow: *Buoy on the Platters;* black, in 4¾ fathoms, with Harwich church on with the cupola of the Chapel in Landguard Fort, bearing N.W.; the White House at Bawdsey Ferry on with the N.E. end of Felixtow Cliff, bearing N.E.; and the Buoy of the Cork, S.E. ¼ E. *Buoy on the Andrews;* black, in 4 fathoms, Arwerton church on with Harwich high-light, N.W. by N.; Bawdsey church on with the N.E. end of Felixtow Cliff, N.E. ¾ E.; and buoy on the Platters, E. ¾ S.

Buoy on the S.E. end of the Ridge; red and white chequered, in 2½ fathoms, with the chimney of the White House at Shotley, on the middle of the red tiled Queen's Storehouse in the Dock Yard at Harwich, bearing N. by W. ¾ W.; the westernmost Martello Tower at Woodbridge Haven just open with the N.E. end of Felixtow Cliff, bearing N.E. ¼ E.; Buoy on the Stone Banks, S.W. ½ S.; Buoy on stony ridges of only 6 feet at low water, at the distance of about 1½ cable's length W.N.W. from the beach of Landguard Fort. A *red buoy* is laid on the outer part of the Altar, in 2 fathoms at low water, with the low light-house just open to the left of the high light-house, N.N.W. ½ W.; the Naze Tower S.W. ½ S.; and the clock-house of Landguard Fort N.E.

At a quarter of a mile N. by W. from the red buoy of the Altar, in Sept. 1833, a *black* buoy, marked on the head *West Altar,* was laid on the western elbow of the shoal. It lies in 12 feet of water, with Harwich light-house N.W. by N., its apparent width open northward of the low light-house; and the first Martello tower eastward of Landguard fort E.S.E. ¾ E. on with the extreme southern outworks of that garrison.

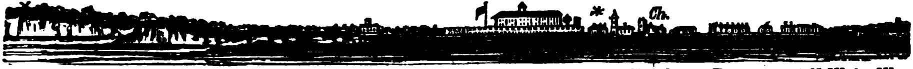
Within the Altar is another narrow ridge, called the *Glutton,* having but 6 and 9 feet over it at low water. Above the Glutton are the *Bone* and *Gristle,* small shoals of 3 feet at low water: within these and the eastern shore is a depth of 5 and 6 fathoms.

The *Guard* is a shelf, which stretches to the eastward, and along the shore of Harwich, upon the western side of the harbour.

The *Cliff-foot Rock* lies at a quarter of a mile without Harwich Cliff, and has only one foot over it at low ebbs.

DIRECTIONS *for the* HARBOUR.—The ENTRANCE of FELSTOW ROAD (the channel to Harwich) lies with Bawdsey church N.N.E., Landguard Fort W.N.W. ¾ W., and the buoy of the Cutler E.N.E. ¼ E. distant a mile and a quarter. The fair course into the PITCHING GROUND is hence due West, giving the white buoy on the Cork Ledge a good berth on the larboard hand, and *carefully avoiding the Cork-spit,* which lies within that buoy on the same side.

From the Pitching Ground, Dover-court church, bearing N.W. by W. ¼ W. leads between the buoys, through the best of the water, into the Rolling Ground, until Harwich lights are in a line, bearing N.W. by N., whence the harbour will be open.



Mark *thro' the* Rough Channel.—*Harwich High Light-house a little to the right of Rainham's Battery, (*) N.W. by W. nearly.*

Harwich Lighthouses.

The present light-houses at Harwich, which are represented in the margin, were first lighted on the 31st of March, 1818. The highest is of grey brick, 60 feet high above the level of high water; the lower is white, and 27 feet only. They exhibit *brilliant fixed lights,* and bear from each other N.W. by N. as above mentioned.

The best channel for entering the harbour was formerly close along the beach by Landguard Fort, at half a cable from the shore; but this channel has grown up so much that the *West Channel,* formerly the worst, is now to be preferred, although it has but 9 or 10 feet at low water: and therefore the two buoys of the Altar, lying as above, are to be left on the starboard side. The mark for entering is, the white house and two poplar trees on the high land of Shotley in a line with the Queen's storehouse, (at the N.E. point of Harwich,) and bearing N.N.W. a little northerly. Having, with this mark, advanced to within the black or western buoy, you haul to the N.E. and cross the Bar, leaving the Glutton and other shoals on the starboard side, as shown by the chart.

When Dover court church, which has a square white tower, comes open to the northward of the houses of Harwich, you will be past the Bone and Gristle, and may either anchor in the middle of the channel, or run up abreast of the town, and anchor in five fathoms. Small vessels commonly go up into the entrance of Ipswich river, where they

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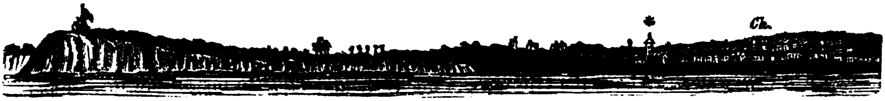
on the Cork, E. ½ S.; Buoy on the Platters, N.E.; and Buoy on the Andrews, North. *Buoy on the inner part of the Ridge; white,* in 2½ fathoms, with Arwerton church touching the West part of the Martello Tower, immediately to the South-westward of Harwich, bearing N.W. by N.; a large tree, inland, its width on the low part of Felixtow Cliff, N.E. ½ E.; Buoy on the Andrews, N.N.E., and S.E. buoy of the Ridge, S. ½ E.

ride out of the way of large ships, and have a far better road with westerly wind. On the west side of the entrance of this river, a long shelf projects from Shotley Point, extending nearly to the distance of half a mile.

The mark for sailing in toward Harwich, and *leading clear of the Rough*, on its north side, is the high-light of Harwich just open to the right of Landguard Fort, and bearing N.W. by W. With this mark kept on until Bawdsey church bears N.E. ¼ E., you will be at the entrance of the Pitching Ground, and may thence steer, between the buoys, as above directed, into the harbour.



Leading Mark *for* **Harwich Harbour.**—***The Light-houses (*) in one, bearing N.W. by N.***

THE PARTICULAR DIRECTIONS FOR HARWICH, &C., WHICH FOLLOW, WERE OBLIGINGLY COMMUNICATED IN 1835.

In running from Hosley Bay for Harwich, bring Orfordness Lights open to the northward, which will clear the edge of the Whiting; and, when you bring Bawdsey church to bear N.N.W. ½ W., (on with the N.E. end of the wood,) you are up with the east end of the Cutler. Then open the low light to the S.E. of the high light; keeping in that direction till Ramsholt church comes on with the west part of Bawdsey cliff, bearing about N. ½ W. You will then be to the westward of the Cutler, and from hence a W. ½ S. course, (according to tide, &c.) will carry you through Felstow Roads to the Pitching Ground, and past the Cork Ledge with its beacon-buoy. Keeping Orford church and castle a ship's length open of Bawdsey cliff will clear the Platters; and Bawdsey church a ship's length open of Felstow Cliff will clear the Andrews, till the lights come on, bearing N.W. by N.

In turning to windward you will find the soundings very irregular off Felstow cliff, as 4, 5, and 6, to 4 and 4½; so stand no further off than to just open the S.W. land of the Naze, till you get to the westward of the Cork Ledge; then stand in till Orford church and castle come within a ship's length of Bawdsey cliff, into 5 fathoms between the Cork Ledge and the Platters. The channel is about one mile wide, and has from 3 to 5 fathoms, at low water, spring tides.

If bound to Harwich Harbour, and the lighthouses are in one, steer with them so until near the Altar; then open them a little to the westward, and bring two tall poplar trees,* standing before the white house at Shotley, on with the west end of the Queen's Storehouse, till the martello tower to the eastward of Landguard Fort comes on with the ramparts of the fort, or two small trees come open to the northward of the fort, so that a passage may be seen between the trees and the fort. Depths in this track about 10 or 11 feet; and it is the channel that must be used.

Steering over, with the martello tower as above stated, keeping on so till you bring the clock and flagstaff of Landguard Fort in one; keep on so till within a cable's length of Walton Ferry, when you must open the flagstaff to the westward of the clock, in order to avoid that flat, till Dover Court church comes open to the northward of the town: but, as Dover Court church, though white, is much hidden by the trees, you will find, when the flagstaff at the redoubt comes open to the northward of the low light, that you will be within, to the northward of all the shoals, and may steer up for your anchorage off the town in 4½ or 5 fathoms.

Should you go to the eastward of the Altar, a passage not approved of, it being so narrow, the beach having grown up,—these will be your marks;—The Lights in one till the flag-staff and the S.E. chimney of the chapel is in one, N.E. ½ N., which will lead in toward the beach till a martello tower comes apparently within its own breadth open to the southward of a wooden store-house standing near Walton ferry; and, as you get in, bring the same wooden storehouse and martello tower in one, which will lead up till you get the clock and flagstaff in one, and may then proceed as before directed. There is a depth of about 10 feet in this channel; but you should prefer that to the west of the Altar, it being much the best and safest.

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* These two poplar trees or the white house are quite conspicuous. They stand upon the top of the high land at Shotley, and look, at a distance, like a hummock.

Your turning marks to the westward of the Altar are, the Eastern martello tower at Shotley (in standing to the westward) a little on with the Ordnance jetty; and be sure you do not shut that martello tower in with the Queen's storehouse, or you will be getting into trouble; and in standing to the eastward, (toward the Altar) the lights in one and tack will be your guide.

In running from Hosley for Harwich by night, bring the low light of Orfordness open to the northward of the high one till you judge yourself up with the west end of the Whiting; then open the low light to the S.E. of the high light; steering about W.S.W. You may easily know when you are drawing up with the east end of the Cutler, by the appearance of the high land; as the land is low from Orfordness till you begin to come up about this distance, and when you perceive the west end of Bawdsey cliff to bear about north, you are to the westward of that shoal, and may again open your lights to the northward, keeping near W.S.W. and coming no nearer to the shore than 4 or 4½ fathoms, till Harwich high light comes on with the easternmost outbuilding of Landguard Fort. I would then come no nearer than 5 fathoms, (as I should be up with the Platters, which extend a mile from shore,) till Harwich lights come open of the south part of Landguard Fort. I should still keep to the S.W. till the lights come in one, which will lead between the Ridge and the Andrews, in 3, 4, and 5 fathoms; most water near the latter till you get about two cables' length from the point of Landguard Fort beach:—and feeling disposed to bring up in the Rolling Ground keep to the S.W. and open the high light a ship's length to the southward of the low light, where you may anchor in 4 or 4½ fathoms, with Bawdsey cliff a little open of Felstow cliff.

4.—GOLDMER'S GAT, WALLET, *and* NAZE-FLATS, *to* HARWICH.—Description *and* Directions.

NAZE to HARWICH.—The Passage over the Naze-Flats to Harwich, called the Medusa Channel, is bounded on the east by the *Stone Banks* and *Ridge;* and on the west, by the *Naze Ledge, Pye Sand, Holidays,* &c. of which the following is a description.

The Stone Banks are irregular and extensive; on some parts there is a depth of only 6 feet over them at low water.

In 1821 a buoy was laid here, on the eastern side of the Medusa Channel, or Inner Passage to Harwich. This buoy is *black*, with a white cross painted on the top, and a white band round the top and middle. It lies on the upper part of the bank, or bench, between the West Rocks and Harwich Naze, in 2½ fathoms, with the Naze Tower bearing W.S.W. ½ W., Harwich high-light N. ¼ W., Dover-court church N.N.W. a little westerly, the first Martello Tower to the eastward of Landguard Fort just touching the westernmost of the Three Windmills to the right of the tower, N.N.E., and a conspicuous tree just touching the highest and southernmost part of the Naze land, W.S.W. ¼ W.

The Naze Ledge is the rocky and shoal ground which surrounds and extends from the Naze to a distance of a mile and a half S.E. ½ E. from the Naze Tower. On the extremity without are 2 and 3 fathoms, but on some parts of the shoal within only 5 feet, at low ebbs.

The Pye Sand extends from Walton Stone Point 2¼ miles E.N.E. It is dry at low water, spring-tides, and partly dry at half-ebb. The north Point lies with Harwich Cliff N.N.E. distant one mile and a half. Between is the entrance of Hamford water, on the bar of which is a depth of 6 feet.

DIRECTIONS for Harwich by the *Inner Channel.*—From off the beacon-buoy on the Gunfleet Head, the leading-mark for the channel, called *Goldmer's Gat*, is Walton-hall just open to the right of the Naze-tower. With this mark run in, 3½ miles from the buoy, until you bring the high-light of Harwich N. ½ E. in a line with Blackman's Head, on the eastern side of Harwich Cliff. You will now be at the entrance of the Medusa Channel, the mark for sailing through which is a large red brick house at Walton, (within Landguard Fort,) about half its length open to the left of the high-water mark of Landguard Point, and bearing nearly N.N.E. Having run thus until the tower behind Landguard Fort comes on the S.E. corner of that fort, you will come into the Rolling Ground, where you may anchor in 3, 4, or 5 fathoms, or thence proceed as before directed.

Those coming through Goldmer's Gat for the Rolling Grounds and Harwich, must be very attentive to the tides, and wait until they are well assured of having water sufficient for crossing the Naze. In order to proceed, keep Walton Hall just open to the right of the Naze tower, until you bring a white house on the declivity of a hill, rising from the west side of Walton Bay, a little open to the southward of the Naze cliff: keep on to the eastward with these marks until the low light of Harwich is in one with the chancel end of the church, or with the high-light N. ¾ W.; either of these marks leads you up to an anchorage in the Rolling Grounds. With the low light half-way between the church and high light you will find the best ground and most water. You will be to the northward of the Ridge when Bawdsey cliff and Felixstow cliff are in one.

The WALLET.—The Wallet is the extensive space or channel between the Gunfleet Sand and the coast to the N.E. It is generally clear and even, the depths being from 5 to 7 fathoms; but there is a shoal in it, called the *Copperas Ground*, of 3¼ and 3½ fathoms, the eastern part of which bears, from the east end of the Gunfleet, W. ¼ N. 5¾ miles, with the Gunfleet Beacon S.S.E. ½ E. 2½ miles. It extends thence a mile and a half W.N.W. Between lies the channel of the Wallet and the East Knock of the Gunfleet. To the northward of the shoal there are gradual soundings to the shore, from 4 to 1 fathoms: but W.N.W. ½ W. 2 miles from it, is a shoal spot, called the *Tripod*, nearly dry at low water.

The Western Entrance into the Wallet, from the East Swin, is the Swash or Spitway between the Buxey and Gunfleet, which is pointed out by the buoys, called the *buoys of the Spitway*, already described on page 25. Of these, the southern or outer one is *black*, the northern or inner one *red*, with a *staff and ball;* and both are to be left, on sailing in from the Swin, upon the right or starboard hand, as already shown in the note, page 25.

GOLDMER'S GAT.—The Eastern Passage into the Wallet is Goldmer's Gat; the leading mark is that before mentioned, viz. Walton Hall just open to the right of the Naze tower: whence you may haul round the Gunfleet, and anchor wherever agreeable, at the back of that sand.

The best permanent anchorage is, however, stated to be where Great Clackton church is on with Little Holland Hall; and Harwich Cliff a little open to the right of Harwich Naze. Here, at the distance of about 4 miles W. ¾ N. from the Gunfleet buoy, there is exceedingly good riding with S.E., southerly, and S.W. winds; as thereabout, the Gunfleet dries at the first two hours' ebb. If, when in the King's Channel, at the length of the Gunfleet buoy, bad weather appears to be coming on, the safest method will be to work up to the northward of the sand, to the distance above mentioned, and anchor in 5½ or 6 fathoms, where you will have better riding with half a cable upon the small bower, than you would have had with both anchors a-head, and whole cables out, on the south side of the sand.

To sail out through the Gatway, from the Wallet, bring the Naze-tower N.W. ¾ N., and steer, with flood-tide, S.E. by E.; with an ebb, S.E. by S. or otherwise, according to wind and tide, with the leading mark before described, which will carry you in 6, 7, or 8, fathoms, until the water deepens to the southward of the sand. In working out, you may stand to the northward, until Walton Hall comes on with the Tower, into 6 or 7 fathoms, and to the Gunfleet into 5 fathoms.

TIDES *between the* King's Channel *and* Orfordness.

In Harwich Harbour, or at the entrances of the rivers of Ipswich and Manningtree, as well as at those of Woodbridge and Orford, it is high water, on the full and change, at 11h. 50m. The rise at Harwich is 11 feet; at Woodbridge Haven 9½; at Orford 6¾. At about a mile S.S.W. from Orfordness the stream turns, or alters its direction, at 11h. 26m.

At Ipswich Kay it is high water at 12h. 30m.; rise, 6½ feet: at Mistley Thorne Kay, 12h. 25m.; rise, 9¾ feet: at Woodbridge Kay, 12h. 45 m.; rise, 7 feet: at Orford Kay, 12h. 11m.; rise, 6¾ feet.

SECTION IV.

KING'S CHANNEL *and* ORFORDNESS *to the* DOWNS.

DESCRIPTION.—The dangers which bound the tracks to the Downs, from the King's Channel and Orfordness, and which have not yet been described, are, the *Gabbards*, the *Galloper*, and *Falls*, on the eastern, and the *Longsand Head*, with the *Kentish Knock*, on the western, side.

GABBARDS.—The INNER GABBARD is a narrow, irregular shoal, having on its shoalest part, near the middle, only 13 feet at low water, and on a spot one mile and a half more to the southward, 16 feet. On other parts the depths are 3½ to 4, 5, and 6, fathoms. The north end lies 14½ miles S.E. ½ S. from the high-light of Orfordness, and the sand thence trends 5½ miles S.W. ¾ S. Near it, on the eastern side, are from 10 to 14 fathoms of water, and on the western side 9 to 15 fathoms.

THE OUTER GABBARD is 4 miles to the eastward of the Inner Gabbard. It is a similar shoal, but divided into two parts by a narrow swashway. The north end is 18½ miles S.E. ¼ E. from the high light of Orfordness, and the general trend of the shoal is S.S.W. ¼ W., 3½ miles. On its shoalest part, at three quarters of a mile from the north end, are 15 feet at low water. The soundings about it are from 6 to 12 and 15 fathoms.

By order of the Trinity House, a buoy has been laid on the central part of each sand, in 2½ fathoms; that on the Inner Gabbard is *black*, and that on the outer *red and white*, striped. They bear E. and W. from each other, about 5 miles.

From the black buoy on the Inner Gabbard, Orfordness lights bear N.N.W. ½ W. about 15½ miles; the south buoy of the Shipwash, W.N.W. ¾ W. 12½ miles: the Sunk light, W. ½ S. about 18 miles: the Galloper Light, S.S.W. ¾ W.

From the red and white striped buoy on the Outer Gabbard, Orfordness lights bear N.W. ¼ N.; the South buoy of the Shipwash W. ¾ N., 14½ miles; the Sunk light, W. ½ S., 25 miles; the Galloper Light, S.W. ½ W. 14 miles.

Excepting at slack water, there is a constant rippling of the tide over the Gabbards, and by this the situation of each may be ascertained in hazy weather, when the buoys cannot be seen.

GALLOPER.—The north end of the Galloper lies S. by E. ½ E. 20½ miles from Orfordness. The shoal thence extends S.W. ½ S. 4½ miles, from 7 to 7 fathoms. It is about half a mile broad in the broadest part, which is near the middle of the sand, and the least depth upon it is 6 feet at low water. From Orfordness, the south end bears S. ½ E. 23½ miles.

Near the sand, on the Eastern side, are 17 and 16 fathoms; and, at three miles from it, on the same side, are 27 fathoms, coarse ground, with small black stones. Near the south end are 14 and 15 fathoms, the ground stony; and, at about three-quarters of a mile from the north end, are 14 fathoms, with similar ground.

Since the year 1804, a vessel has been moored near the south-west end of the sand, in which two *brilliant lights* are exhibited, horizontally, from sun-set to sun-rise, at 32 feet above the level of the sea, and may be seen at ten miles off. In order to prevent any mistake of this for the other lights in the vicinity, it is to be observed, that the vessel has two masts, with a light at each mast-head, that it may be readily distinguished from the Sunk and Goodwin lights, the former of which is exhibited with one light only, and the latter with three lights.

The light-vessel was first moored within less than half a mile of the sand, in 13 fathoms; but it now lies in 15 fathoms, at low water; the shoalest part of the sand, bearing N.E. from the light, distant about two miles, where there are only 6 feet at low water. Upon the extremity of the shoal, within the light, a buoy is placed, that the usual position of the vessel may be known, in case it should drift away, or be removed from its place.

From the light-vessel, situate in latitude 51° 45½′ and longitude 1° 53′ E., the high light-house on Orfordness bears N. ½ W. 23 miles; the North Foreland nearly S.W. by W. ½ W. 28 miles; and the Longsand Head, W.N.W. 10 miles.

The FALLS is a long bank or ridge, about half a mile in breadth. It is imperfectly known: but appears to extend, from its northern end, nearly 20 miles S.W. ½ S. From this end, on which there are 6 and 7 fathoms at low water, the south end of the Galloper bears N.E. by N. distant about 10 miles; and the east part of the Kentish Knock N.N.W. about 12 miles. Between the Falls and Galloper are 8, 10, 18, 12, 25, 12, 15, 25, 30, 13, 12, and 10 fathoms; the latter depth, being close to the south end of the Galloper. On the middle of the sand are 4 and 5 fathoms; to the southward, 3½ fathoms, gradually increasing to the southern extremity of the shoal.

LONG SAND.—From the Sunk light vessel, the bearing and distance to the Longsand Head are S.E. ½ E. 4½ miles; and from the N.E. buoy of the Gunfleet S.E. ½ S. 7¾ miles. A considerable part dries at half ebb. Vessels should not, in passing, approach it nearer than in 10 fathoms. Off the Head the ground is sandy. From its extremity, the N.E. end of the Kentish Knock lies nearly S. ½ E. distant 4 miles.

In February, 1826, by order of the Trinity-House, a *black buoy* was moored at the Longsand Head, in 6 fathoms, with the Sunk light-vessel bearing N.W. ½ W. 4½ miles; the Kentish Knock buoy (next mentioned) S. by W. ½ W. westerly; the Naze Tower N.W. ½ N., and just touching the S.W. side of Walton Hall.

KENTISH KNOCK.—This shoal, lying nearly parallel to the outside of the Longsand, at the distance of 3 miles, seems to have grown up very much within the last few years, and it now occupies an extent of no less than 7 miles N.E. and S.W. Its greatest breadth, near the middle, is a mile and three quarters. Some part dries at low water. From the S. end the North Foreland light-house bears S.E. ½ S. 13½ miles, and the East or beacon-buoy of Margate Sand S.W. by W. 10 miles.

Notice was given, dated Trinity House, 1st June, 1824, that a buoy, striped *black* and *white*, from the *nozzle* to the *head*, a *white circle* upon the *head*, and a *black centre* with the words "*Kentish Knock*," in *white* letters upon it, carrying a *beacon* or *staff*, on the top of which is a globe quartered perpendicularly black and white, had been placed on the *East* side of the *Kentish Knock*, four miles and three-quarters from the S.W. end, and two miles and one-quarter from the N.E. end, in 5 fathoms at low water, spring tides, with the North Foreland light, S.W. westerly, 18 miles: the Sunk light N. by W. 9½ miles; and the Galloper light, E. by N. 11 miles.

On the outside of the Knock, near the buoy, are 10 and 11 fathoms of water. The general depths between the Knock and Longsand are from 8 to 12 fathoms; but it would be imprudent, if not hazardous, to attempt this channel, unless in case of necessity.

WATCH BUOY.—Notice was given from the Trinity House, 4th Sept. 1829, that the corporation had deemed it expedient to place a *Watch Buoy* near the buoy of the Kentish Knock; and that this buoy is laid in 5 fathoms at low water, about a cable's length S.W. by S. from the Beacon buoy.

The Watch buoy is *black*, with the head thereof *half white*, and is marked with the words *Kentish Knock*.

DIRECTIONS.—*From the N.E. or beacon-buoy of the Gunfleet*, the bearing and distance to the buoy on the Longsand Head, are S.E. ½ S. 7¾ miles; and from the Sunk light-vessel, S.E. ½ E. 4½ miles. The course and distance from the Gunfleet buoy to a fair-way, are, therefore, S.E. ½ E. 8 miles; making, however, a large allowance for the tide, which sets nearly on the beam. When clear of the Longsand Head, a course South or S. ½ E. will clear the Knock, whence you may proceed as hereafter directed.

From Hosley Bay and Orfordness.—If bound to the Downs, from Hosley Bay, with an easterly wind, turn down to Orfordness with an ebb-tide, and proceed thence to the eastward of the Shipwash. The course, in a fair way, from Hosley Bay to the Ness, is, agreeably to the former directions, E. by N. northerly, distance about 5 miles.

The high-light on Orfordness, kept N. by W. ½ W., will lead clear of the light-vessel off the N.E. end of the Shipwash, and into 11 or 12 fathoms. In sailing off or along this sand, observe the precaution noticed in the description of it, by allowing for the set of the tide, the direction of which is about two points athwart the sand.

The course and distance hence, to the eastward of the Kentish Knock, will be nearly S.S.W.

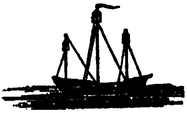
S.S.W. 7 leagues; still continuing to make proper allowance for the tide, whether ebb or flood.

With coutrary winds, you may stand in toward the Shipwash to 12 and 14 fathoms, and off to 20; toward the Longsand Head to 9 and 10, and off to 20; and to the Knock into 12 and 13 fathoms.

The Sunk light-vessel will now bear about N.N.W., in which case, the course and distance to the North Foreland will be S.W. ½ W. nearly 6½ leagues; or to the Gull Stream, S.W. ¼ S. 7½ leagues.

GOODWIN.—The FLOATING-LIGHT of the GOODWIN being principally intended for the use of vessels from the northward, we shall conclude this section with its description and uses, as published by authority.

This vessel exhibits *three brilliant lights* on separate masts, at 35 and 23 feet above the level of the sea; the main-mast being the highest.



The light-vessel now lies nearly E.N.E. three-quarters of a mile from the nearest part of the North Sand Head of the Goodwin, in 9 fathoms, with the North-Foreland lighthouse N.W. ¾ N. 6¼ miles; Ramsgate Pier lighthouse N.W. by W. ½ W. 6¼ miles; and the South Foreland high light S.W. by W. ¾ W. 13½ miles.

In order to distinguish this light from the two Foreland lights, the lights are exhibited on board, in such a manner, that the middle light appears considerably higher than the two extreme lights, forming an erect triangle, so that it can never be mistaken for either of them. And, in foggy or hazy weather, the sound of a gong will warn ships that they are near the North-sand Head. The situation of the light renders it impossible for any vessel to get upon the North-sand Head, or any part of the Goodwin, if proper attention be paid to the following short and clear directions:—

1st. The grand intention of the Goodwin light being to keep vessels to the eastward of the Goodwin, the masters of all ships and vessels, in coming from the North-Sea, toward the Strait of Dover, must be careful not to bring the Goodwin light to bear more southerly than S.S.W. by compass; but, on the contrary, they should always keep the light rather to the westward, than to the southward or eastward, of that bearing, while they are to the northward of her; and they will be sure then to pass far enough to the eastward of her, and every part of the Goodwin, by steering a S. by W. course after they pass her.

2dly. The masters of all vessels coming from the Strait of Dover, toward the North-Sea, must be very careful not to shape a northerly course, until the Goodwin light bears N. by E. by compass; but, on the contrary, they should always keep the light rather to the northward of that bearing, than to the eastward of it, while they are to the southward of her; and they will then be sure to pass far enough to the eastward of her, and every part of the Goodwin. And,

3rdly. Should any ship or vessel, coming from the North-Sea toward Dover Strait, be forced by unavoidable necessity, on account of wind or tide, or otherwise, and the master, through choice, gives up his intention of proceeding to the southward, at the back of the Goodwin, or to the eastward thereof, he has it in his power, by a single bearing of the Goodwin light, to anchor under the North-sand Head, in 6 or 7 fathoms of water, clean ground, and ride there as safely as the light-vessel does; in order to which, he must keep to the northward of the light; and, when it bears about south of him, half a mile or so distant, he may anchor. Or, should he prefer getting in to the westward of the Goodwin, so as to have the Gull Stream open, he may run in to the northward of the Goodwin, upon a N.W. course, till he judges he has run about 2½ or 3 miles within, or to the N.W. of the light, and anchor in 7 or 8 fathoms, with the light bearing S.E.

SECTION V.

ORFORDNESS *to* FOULNESS, *including* YARMOUTH ROADS *and* HASBOROUGH GAT.

THE objects which appear on the coast described within the limits of this section are pleasing and interesting. In succession are seen the lighthouses of Orfordness, Lowestoff, Pakefield, Winterton, Hasborough, and Cromer; and, in the intervals, numerous churches, cultivated lands, and other cheerful scenery. The coasts are variable. From Orfordness, which is low, the land to the northward increases in height. The coasts of Suffolk and Norfolk to the southward of Hasborough, are, however, rather low than otherwise: but Foulness, and its adjoining coasts, is a perpendicular cliff, which is, at Mundesley, from 50 to 60 feet in height.

The New Chart of the Eastern coast sufficiently indicates the form of the Shoals, and the intricacy of the navigation along shore. Commencing from the southward, we have the banks in the vicinity of ORFORDNESS and ALDBOROUGH; next those about LOWESTOFF, forming the INNER PASSAGE; and again those in the vicinity of Yarmouth and Winterton, which form YARMOUTH ROADS, the COCKLE-GAT, and HEMESBY-GAT; all which we shall attempt to describe, as they have been proved to exist by the recent surveys, with the buoys and beacons on each, as lately improved by order of the Honorable Corporation of Trinity-House. *Variation of the Compass*, 24° West.

The Geodetic Positions of the chief points have been ascertained as follow:

Orford High Lighthouse,	*Latitude*	52°	5′	0″N.	*Longitude,*	1°	34′	14″E.
Southwold Church		52	19	37 —		1	40	27 —
Lowestoff old Church		52	29	5 —		1	44	15 —
Lowestoff High Lighthouse		52	29	10 —		1	45	10 —
Yarmouth Church		52	36	40 —		1	43	30 —
Cromer Lighthouse		52	55	20 —		1	19	30 —

PAKEFIELD LIGHTHOUSE.—At the distance of three miles to the southwestward of Lowestoff South Ness is a Lighthouse within the cliff of *Pakefield*, which was established in 1832. This structure is white, and now exhibits a light coloured *red*, which prevents mistakes arising by lights seen through the windows of houses in the vicinity. The height from the base to the lantern is only 23 feet; but, from the elevation of the land, the light is 68 feet above the level of the sea, and may be seen more than four leagues off. The angle of light is from S.E. by E. ¼ E. to S.E. ¾ S.

LOWESTOFF LIGHTHOUSES.—These two lighthouses stand within Lowestoff Ness, and in a line bear N. ¾ E. They are half a mile asunder, and exhibit brilliant fixed lights. The low light stands near the beach, at two cables' length from the South Ness, and the high light on the high land, its lantern being 113 feet above high water.

In noticing Lowestoff church, hereafter, it is to be understood that the church meant is the old church, with a spire, to the northwestward of the town, and not the church of St. Peter, on the south side, which was built in 1834.

LOWESTOFF NEW HARBOUR.—The entrance of Lowestoff Harbour is nearly half a mile to the south-westward of the low light. Within the piers, to the lock-gates, there is a depth of only 3 to 9 feet at low water, with a shingle beach on either side, at the back of the piers: a warping buoy lies on the outside, and there are beacons within for the direction of vessels in the best water. The harbour is formed by *Lake Lothing*, now connected with the sea on the east; and, by means of new cuts and canals westward, with the Rivers *Waveney* and *Yare*, as shown on the Chart, thus communicating with the city of NORWICH. By the completion of this undertaking, Beccles and Norwich are enabled to receive vessels of burthen, and a harbour is established which promises to be of great utility.* It is, however, to be observed that vessels of 6 and 7 feet only can pass the Bar at high water of neap tides, and of 8 or 10 feet only at high springs. The Bar is nearly dry at low water.

Having, in our preceding section, given a description of, and instructions for sailing by, the *Shoals in the vicinity of Orfordness*, we now proceed to describe the

SHOALS *between* THORPNESS *and* WINTERTON-NESS, *including* YARMOUTH ROADS.

SIZEWELL BANK, to the E.N.E. of Thorpness.—This bank, like many others, has, within a few years, considerably increased, and it now in fact, forms a shelf, three-quarters of a mile broad, from the south end of Aldboro' town to the distance of nearly six miles to the N.E. The depths on it vary from 4 to 2½ fathoms; but, on its shoalest part, at a mile and a quarter from Sizewell, are only 9 feet at low water. This spot lies with Thorpness W.S.W. ½ W. one mile and a half, and Dunwich church N. by E. 4¼ miles.

The N.E. extremity of the shoal, 4 fathoms, lies with Blytheboro' and Dunwich churches in a line, bearing N. ¼ W. You clear this end by keeping Blytheborough lodge (a farm house standing in the midst of a grove of trees) open to the eastward or right of Dunwich church.

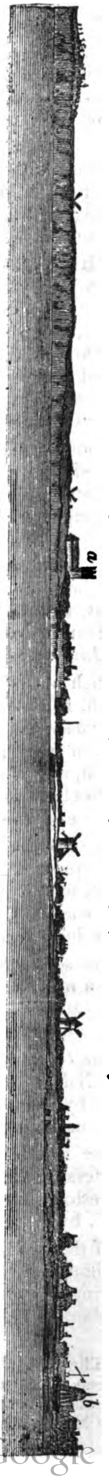
A *white buoy*, marked "*Sizewell Bank*," has been laid on the S.E. edge of the shoal in 4¼ fathoms, with Leiston church, itself midway between the preventive station-house and a red-tiled farm-house and barn at Sizewell, bearing N.W. by W. ½ W.; Dunwich church N. by E.; Orfordness lights S.W. ¼ W.; and Aldboro' church S.W. by W. ½ W.

Orford castle open to the southward of Aldboro' town, or bearing S.W. by W. ¾ W., leads clear of the bank, as shown in the coasting chart, above mentioned.

DUNWICH BANK, which lies at a mile eastward from the shore of Dunwich, is a shoal of 3¾ and 4 fathoms. It is a mile and two-thirds in length, trending N.E. by E. ½ E. and S.W. by W. ½ W. In the channel between it and the shore are from 4¾ to 5½ fathoms. You clear it from the southward with Covehithe church well open to the eastward of the low N.E. end of Easton cliff: and from the northward with Aldborough church open to the eastward of Thorpness. These marks lead clear of the eastern edge in 5, 6, and 7, fathoms.

BARNARD.—The next shoal, to the southward of Lowestoff Roads, is that called the *Barnard;* the south end of which lies at the distance of about three-quarters of a mile from the shore, S.E. by E. from Covehithe church. It extends thence N.E. 3 miles; is a quarter of a mile in breadth, and has but 2 feet on its shoalest part at low water. It is steep-to on the eastern side. Between its south end and the shore, is a depth of only 6 feet at low water. To steer clear of it, keep Southwold church at the least twice its apparent breadth open to the left of Easton houses, which stand within Easton Cliff.

In April, 1834, the Corporation of Trinity-House caused *a buoy painted red*, to be laid on the *south-west end* of this *sand*, in 6 fathoms


(a) Kirkley church.
a
Lower Lighthouse (b) W. ¼ S.
b

The Coast to the southward of Lowestoff, when the lower Lighthouse (b) bears W. ¼ S., distant six-tenths of a mile.

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* On first opening the great sluice lock (3d June, 1831,) the salt water entered with a strong under current, over which the fresh water ran out to the sea. The fresh water was gradually raised to the surface, and the entire body of water in the lake was elevated above its former level. At a short distance from the lock, in the lake, there was a clearly defined line, where the salt water might be taken up in one hand and the fresh in the other. The admission of the sea-water proved fatal to thousands of the inhabitants of the lake, and its surface was seen covered with dead pike, carp, perch, bream, roach, dace, &c.

with Southwold church tower bearing S.W. by W. ¼ W., twice its apparent breadth open southward of the houses upon Easton-ness; Lowestoff church on with the highest windmill at Kirkley, N.N.E.; Covehithe church tower, W. ½ N.; and Kessingland church tower, N. by W.

In October, 1828, *a white buoy* was laid off the *north-east end* of this sand, in three fathoms, with Southwold church on with Easton-ness Point S.W. by W.; Kessingland church W.N.W. ½ W.; Lowestoff church N. by E.; and Pakefield church N. ¼ W. The bearing and distance from this buoy to Pakefield lighthouse are N.N.W., rather more than one mile and a half.

The NEWCOME is a bank of recent formation, which extends in a N.E. by N. and S.W. by S. direction, to the southward of Lowestoff, and forms the passage called the INNER CHANNEL and LOWESTOFF SOUTH ROAD. It is now two miles and a quarter in length, and a part of it is nearly dry at low water. Toward the North end the bank is narrow, and is distinguished by a light-vessel, described hereafter. The south end is connected by a ridge of 2½ and 3 fathoms, to the *Barnard*, above described. The distance between is one mile and a quarter, and this space forms the entrance into the Lowestoff or Inner Channel.

Another Shoal, called LOWESTOFF INNER SHOAL, has also been formed off the *South Ness* of Lowestoff. It is nearly half a mile in length, N.W. by N. and S.W. by S.: over its central part are only 8 and 9 feet at low water: but between it and the shore on the west, a passage nearly one quarter of a mile wide, are 3 and 3½ fathoms.

The STANFORD PASSAGE, which was formerly the Inner Channel to and from Yarmouth Roads, and which had for several years been growing up,,has at length become so shoal as to be unfit for general navigation. In a Trinity-House notice, dated 13th May, 1836, it was, therefore, stated that, as the depth of water had so much decreased, the buoys marking that passage would be discontinued, and other buoys substituted for the navigation of the *Inner Channel*, on the west side of the *Newcome*, which is now the general passage.

Such buoys have since been placed;—they consist of *four black buoys* on the Newcome, which, in proceeding northward, are to be left on the starboard or eastern side; and *two white buoys* on the *Inner Shoal*, off Lowestoffness, which are to be left on the larboard or western side; and besides these, the Stanford Light-vessel has been shifted from its former station, and is now so placed as to form a triangle with the two northern buoys of the Inner Channel: it is, consequently, to be left in passing, whether from the northward or southward, on the eastern side.

The first buoy, called the *South Buoy of the Newcome*, lies at the distance of a mile and three-quarters N.N.E. ¼ E. from the white buoy on the N.E. end of the Barnard. It is black, with a staff and ball. From this buoy Pakefield lighthouse bears W. by N., Pakefield windmill, in a line with the N.E. end of a barn on the cliff, N.W. ½ W., and a new black buoy, called the *S.E. Holm Buoy*, E.N.E. ½ E., two miles distant.*

The second buoy on the Newcome, called the *S.W. Newcome Buoy*, lies in 4 fathoms, at half a mile N. by W. from the South Newcome or beacon buoy. It lies with Pakefield lighthouse W. ¾ S., and Lowestoff windmill in a line with the centre of the Harbour Master's house, N. ¾ E.

The third black buoy, marked *W. Newcome*, lies in 4¼ fathoms, at three-quarters of a mile N.N.E. ¼ E. from the preceding or S.W. Newcome buoy, with Pakefield lighthouse S.W. by W. ¼ W., Lowestoff lower lighthouse N. by E. ½ E., and Lowestoff church spire, in a line with the N.E. end of the Harbour-Master's house, N. ½ W.

The fourth black buoy, marked *N.W. Newcome*, lies in 3¾ fathoms, at nearly three-quarters of a mile N.E. ¾ E. from the N.W. buoy, with Lowestoff lower lighthouse N.W., Lowestoff church spire, in a line with the N.E. end of Lowestoff preventive-station-house, N.W. by N., and the Northern Inner Shoal buoy *(white)* N. by E.

Of the *two white buoys* on the edge of the Inner Shoal, the first or southernmost lies in 3 fathoms, N. by W. ½ W· one-third of a mile from the N.W. buoy of the Newcome, with Kessingland church bearing S.W. ½ W. and Lowestoff high light its breadth open to the eastward of the lower light, N. ½ E.

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* The *S.E. Holm Buoy* was first placed in June, 1836. It lies in 6½ fathoms, nearly midway between the South Newcome and N.E. Holm Buoys, with Lowestoff church spire in a line with the Lower lighthouse, N.W. by N., Pakefield church tower its length open south of Pakefield windmill, W. by N., and the N.E. Holm or South Corton buoy N.E. by E.

The northern white buoy lies at about three-eighths of a mile N.E. by E. from the southern one, with Kessingland church bearing S.W. 7° W., Gorleston church steeple four times its apparent length open to the eastward of Corton cliff, N. ¾ E., and the Stanford light-vessel S.E. ¼ E.

The Stanford Light-vessel, as above noticed, forms a triangle with the North Newcome buoy and the North buoy of the Inner Shoal. This vessel lies with the N.W. Newcome buoy bearing S.W. rather more than half a mile, Pakefield lighthouse S.W. by W. ¼ W., the North Lowestoff or Inner Shoal buoy N.W. ¾ W., one quarter of a mile, and Corton church tower in a line with the outer part of Corton cliff N. ¼ W.

"*In the night-time*, Vessels from the Northward may steer up from Yarmouth Roads for the Light Vessel, and passing near to, and to the N.W. of her, steer in S.W. by W. ½ W., which will take them in the fair way between Lowestoff Inner Shoal and the Newcome Sand, until the Low Light at Lowestoff bears N.E. by N.; from thence, steering S.W. by S. till Pakefield Light bears N.W., they may run out S.E. to sea, between the Barnard and Newcome Shoals. The opposite Courses are to be attended to when entering and passing through this Channel from the Southward."

INNER CHANNEL.—*Vessels approaching this Channel, from the southward*, will leave the white buoy off the N.E. end of the Barnard on the west or larboard side; and proceed in with Pakefield lighthouse bearing N.W., or Pakefield mill and barn in one, N.N.W. ½ W. as the latter will clear the south end of the Newcome. The course thence will be, to clear Lowestoff Inner Shoal, N.E., and the mark to clear the latter, Covehithe church over the extremity of Kessingland fish-houses, in the opposite direction. Vessels working, and standing either toward the Barnard or Newcome, must immediately tack on losing sight of Pakefield light.

It was further noticed, on the 27th of July, 1832, that "During certain states of the atmosphere, a *faint* light, from Pakefield lighthouse, may be seen at both the South Newcome and Barnard Buoys; and as the lighthouse bears from the Barnard Buoy N. by W. ½ W., and from the South Newcome Buoy W. by N., the commanders of vessels are recommended, when working between these buoys, to *tack short* at those bearings. Vessels navigating with a fair wind should keep the light bearing N.W."

The HOLM and CORTON, formerly distinct shoals, are now united into one bank, nearly 7 miles in extent from north to south. *Five black buoys* mark the eastern edge, and there are *two white ones* on the western edge, which distinguish the bounds of Corton Roads. Upon the bank, at a mile and a quarter S.E. by E. from Lowestoff low-light, is a large patch which dries 6 feet in height, and other spots dry at low spring-tides.

The *first of the black buoys* above-mentioned, on the eastern edge of the Holm and Corton, is marked *S.E. Holm;* it lies in 6 fathoms, and bears N.E. by E. ½ E. from the South Newcome beacon-buoy, and S.E. by S. 2½ miles from Lowestoff church.

The *second black buoy*, called the *N.E. Holm*, in 4 fathoms, bears N.E. ½ E. a mile and three quarters from the S.E. Holm, and about 2$\frac{4}{10}$ miles E. ½ N. from Lowestoff high light.

The third black buoy, called the *S.E. Corton*, lies in 5 fathoms, at one mile and a quarter N.N.E. ¼ E. from the *N.E. Holm*, with Corton church bearing W. by N. 3$\frac{1}{10}$ miles distant.

The fourth black buoy, called the *N.E. Corton*, bears from the S.E. buoy N. ¼ E. one mile and three-quarters. It lies in 4½ fathoms, with Hopton church W.N.W., 2¾ miles, and Gorleston church, N. ¾ W.

The fifth or *Corton Spit Buoy* lies in 4 fathoms, at three-quarters of a mile N. ¼ W. from the N.E. Corton, with Gorleston church tower N.W. by N., its apparent length open to the northward of the North pier; Lowestoff high lighthouse S.W. ¼ S.; Corton church tower W.S.W. ½ W.; and Yarmouth church spire, N. by W.

The *N.W. Corton buoy*, on the extremity of the sand, in 2¾ fathoms, with the N.E. Corton Buoy in line with the Corton Spit Buoy, S. by E. ½ E.; a white windmill westward of Gorleston in line with a house at the southern extremity of the town, N.W.; and Yarmouth church in line with a high mill, *(Harrison's)* and the new bathing houses North of the jetty, N. ½ W. This buoy marks the western side of the GORLESTON or NEW CHANNEL, leading to Yarmouth Roads, the fairway through which lies N. by W. and S. by E.*

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* In approaching the Corton it is to be recollected that the flood-tide sets strongly to the southward, over that sand, and the ebb in the contrary direction, over the banks to the northward.

On the opposite side of the Gorleston or New Channel, are the *St. Nicholas Buoys* and *St. Nicholas light-vessel.* The channel is only one third of a mile wide, and its depths, at low water, in 1837, were 5 and 6 fathoms. The first of the Nicholas buoys is a *red beacon-buoy*, which lies in 5½ fathoms, with Corton church tower S.W. by W. ½ W., 3¼ miles; the southern part of a cluster of trees in a line with Nelson's monument on Yarmouth denes, N.N.W. ¾ W.; and Hemesby church tower in a line with Caistor north mill, bearing North.

The Inner Nicholas Buoy, red and white striped, lies in 4 fathoms, one third of a mile N.N.W. from the red beacon-buoy, with the low light at Lowestoff just open southward of the Fish-houses, S.W. by S.; the N.W. Corton Buoy, S.W. ¼ W.; and the southern extremity of a grove of trees apparently touching the northern base of Nelson's monument, N.N.W. ¾ W.

The St. Nicholas Light-vessel lies at nearly half a mile N. ¼ W. from the striped buoy. This vessel is moored in 6 fathoms, with Gorleston South Mill, in a line with the south pier of Yarmouth harbour, bearing W.N.W. ¾ W.; Yarmouth church tower, its apparent width open northward of Yarmouth jetty, N. by W. ¼ W.; St. Nicholas buoy, S.E. ½ S.; Kettlebottom Buoy, N.N.E. ½ E.; Inner Cross Sand and Cross Sand Buoy, in a line, S. by E. ¾ E.; N.W. Corton Spit Buoy, S. ½ E. and N.W. Corton Buoy, S. ½ W.

The vessel is painted *red*, with the name on the side. The light is similar to the *Swin Middle*, described in page 23; a single lantern, elevated 36 feet above the water, and during the day distinguished by a *red ball* at the masthead, which, in the event of the vessel's driving from her proper station, will be taken down.

St. NICHOLAS' GAT, although much contracted by the formation of St. Nicholas' Bank, is still the principal channel-way to Yarmouth Roads, the eastern side being formed by the Scroby, and the western by St. Nicholas' Bank. The entrance, between the southern buoys of the two sands, is three-quarters of a mile wide, but the northern part is contracted to less than half a mile. Its depths, in 1837, were from 6½ to 10 fathoms, in a N. ½ W. and S. ½ E. direction.

The outer buoy to the East is the *South-Scroby, chequered red and white*, and which lies in 3½ fathoms, at three-quarters of a mile E. ¼ S. from the red beacon-buoy of St. Nicholas, with the chancel end of Lowestoff church in line with the south part of red tiled buildings (Mr. Taylor's) near Lowestoff, S.W. ½ W.; and the southern windmill at Yarmouth old town, in line with the northern end of the Naval Hospital, N.W. ¾ N.

The *Scroby Fork Buoy, black* and *white striped*, lies in 5¾ fathoms, N. ½ W. one mile and an eighth from the *South Scroby*, with the red tiled houses near Lowestoff midway between Lowestoff church tower and Lowestoff mill, S.W. ¼ S.; the southernmost windmill at Gorleston in line with the pilot-house on the pier-head, W. ½ N.; and Yarmouth Chapel in line with the jetty-head, N.W.

The *North Buoy of St. Nicholas*, is a *white beacon-buoy* on the north end of St. Nicholas' Sand. It lies in 5 fathoms, at five eighths of a mile N.N.W. ½ W. from the Fork buoy of the Scroby, with Lowestoff church S.W. ¾ S.; the northern mill at Gorleston in line with Nelson's monument on Yarmouth denes, N.W. by W. ¾ W.; and Caistor North mill its apparent breadth open eastward of the Fishermen's look-out station, N. ¼ W.

The *Scroby S.W. Buoy*, white, in 3 fathoms, at nearly three-quarters of a mile N.N.E. ½ E. from the white beacon-buoy on the north end of St. Nicholas', with a cottage, with slated roof, its width open northward of the pilot-house on Gorleston pier, W.S.W. ¾ W.; the chancel of Yarmouth new church in line with the public-house southward of the jetty, N.W. ¾ W.; and Hemesby church its width open westward of a white house and barn, N. ¼ W.

From the buoy last described the sand called the *Scroby* extends 4 miles to the northward, and on its western edge, in 7½ fathoms, at 2¼ miles N. by E. from that buoy, is another white buoy, the *Middle Scroby*, lying with the northernmost mill at Gorleston in line with Yarmouth jetty-head, S.W. ¾ W.; and Hemesby church tower its width on with a conspicuous cottage N.N.W. ¾ W.

The *North buoy of the Scroby*, white, lies in 4½ fathoms at two miles N.E. ½ N. from the Middle Scroby, with Caistor South mill in line with the south end of Caistor cliff, W. ¾ S.; Yarmouth new church apparently touching the north side of a windmill on Yarmouth denes S.W. ½ W.; and Martham church and vanes of a windmill apparently touching its northern side, N.W.

BARBER AND COCKLE.—The BARBER and COCKLE are two irregular shoals to the north-eastward of Caistor, which form *Hemesby Gat* and the N.W. side of the Cockle Gat. Of these the Barber is the southernmost, and within this is a swashway, which we call *Hemesby Gat.*

The edge of the Barber is distinguished by two buoys; the first, called the *Inner Barber,* is *red,* and lies in 3¼ fathoms, with Caistor church in line with the south side of a green mound above the beach, bearing west; Yarmouth chapel in line with the small chimney of the silk factory S.W. ½ S.; Winterton light-tower N. by W.; and the north buoy of the Scroby (*white*) W. ¼ S. one mile and a third distant.

The buoy marked *Outer Barber, chequered black and white,* lies in 5 fathoms, at three-quarters of a mile N.E. from the Inner Barber, with Yarmouth new church tower midway between the second and third mill from the northward, S.W. ¾ S.; Ormesby mill apparently touching the northern side of a cottage, N.W. by W.; and Winterton light-tower, N. by W. ¾ W.

The eastern edge of the Cockle is further distinguished by three black buoys, placed in succession, at nearly equal distances, and the last of which lies with Winterton lighthouse N.W. by W. half a league distant.

The SEA-HEADS is a spit, 4 miles in length, which forks from the *Scroby* on the east, and extends in a direction N. by E. ½ E. On some part of it are only 3 feet at low water; but in the indent between it and the Tongue of the Scroby, called the *Barley Pigtle,* are from 5 to 8 fathoms.

On the western edge of the Sea-heads is a *red* buoy, with staff and ball, lying with the third black buoy of the Cockle and Winterton church and lighthouse in a line, bearing nearly N.W. ½ N. A semi-circular ridge or bar is grown up to the northward, upon one part of which, at a mile and a quarter N.E. ½ N. from the buoy, is a patch of 3 fathoms; and hereabout, with the ebb, are strong ripplings. Caistor church and mill in one, S.W. ½ W. leads over the ridge in 5 and 6 fathoms.

The **CROSS-SAND** and **NEWARP,** the easternmost of the Yarmouth Banks, extend in a N.N.E. and S.S.W. direction, 8 miles, at the distance of about half a league eastward from the Scroby and Newcome Sea-heads. The south end of the Cross Sand is now distinguished by a *black buoy,* which lies in 4¾ fathoms, at the distance of two miles E.N.E. from the chequered buoy on the south end of the Scroby, with Lowestoff church bearing S.W. by W.; the southernmost mill at Gorleston in line with the pilot-house on the pier, W. ½ N.; and Yarmouth church just touching the northern part of the town battery, N.W. ½ W.

On the eastern edge of the Cross Sand, at three miles N.E. by N. from the south end, is another black buoy, called the *North Cross Sand Buoy,* which lies in 6 fathoms, with Lowestoff church spire S.W. ½ W.; a conspicuous cottage chimney (Lieut. Garnam's) in line with Nelson's monument, W. by S.; Hemesby church, apparently touching the southernmost of two windmills at that place, N.W. ¼ N.; and the Newarp light-vessel N.N.E. ¼ E.

NEWARP.—On the north end of the flat of the Newarp, at four miles and two-thirds N.N.E. from the North Cross Sand buoy, is a *red* buoy, lying with Winterton lighthouse W.N.W. ½ W. six miles.*

The NEWARP LIGHT-VESSEL is moored at the distance of a mile N.E. ½ E. from the red buoy. This vessel will be described in its place hereafter. Without it are several ripplings, but nothing that can take a ship up, as there is not less than 7 fathoms on any of them.

DIRECTIONS *for Sailing from* ORFORDNESS, *through the* LOWESTOFF *or* INNER CHANNEL, YARMOUTH-ROADS, *and the* COCKLE-GAT.

ORFORDNESS to the STANFORD.—IN proceeding from Orforduess, you will avoid the Ridge, &c., by keeping Bawdsey Cliff, bearing W.S.W. ¾ W., well open of Orford Beach, until Aldborough church bears N.N.W., when you will be about half way between the black buoy on the Ridge and the S.W. end of Aldborough Knapes. From the last spot a direct course to the bar of the Stanford is N.E. ¾ N. and the distance 20½ miles.

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* During the season of the herring fishery this buoy is taken up, but is replaced after its termination.

Approach, on the west, no nearer to the Sizewell Bank than with Orford castle open to the southward of Aldborough town, and bearing S.W. by W. ½ W. Nor to Dunwich Bank nearer than with Covehithe church well open to the eastward of the N.E. end of Easton Cliff. Aldborough church open of Thorpness, S.W. ½ W. leads clear along the S.E. side of this bank in 5 and 6 fathoms of water.

The mark leading clear of the south side of the Barnard is, Southwold church at the least twice its apparent breadth open to the left of Easton houses, S.W. by W. ½ W.

In SOLE BAY, or Southwold Bay, between Sizewell Bank and the Barnard, there is good riding, with off-shore winds, in 8 or 9 fathoms In approaching the Barnard, go no nearer to it than in 9 fathoms, as it is steep, and there are 8 fathoms near to it on the eastern side.

It is to be observed that the flood sets strongly to the S.W. upon the Newcome, and the ebb, on the contrary, upon the Holm-head.

Vessels from the North-eastward may safely approach the parallel of Lowestoff, or 52° 29′ N., as the soundings are regular. In this latitude they may steer boldly in, either by night or day, into 16 or 17 fathoms. In the night-time the high light may be seen 3 or 4 leagues off; and, in the day, the church, with its spire steeple, and upper part of the town, at the distance of 7 leagues, if the weather be clear.

LOWESTOFF CHANNEL.—We have already given in page 45, the marks for entering the Inner Channel; which are, Pakefield lighthouse bearing N.W. or Pakefield mill and barn in one, N.N.W. ½ W. The course thence to clear Lowestoff Inner Shoal N.E. and the mark to clear the latter.

Having reached the Stanford light-vessel, which is to be left on the starboard or eastern side, you will have passed, on the same side, the three black buoys on the western edge of the Newcome; and, on the western side, the two white buoys on the *Inner Shoal:* the general leading mark is, Covehithe church over the extremity of Kessingland fish-houses, bearing S.W.

The S.W. Corton Buoy (white) lies at a mile and six-tenths N.E. by N. from the Stanford light-vessel, with Lowestoff high light bearing W.S.W. ½ W., one mile and three-tenths; and Corton Preventive staff N.W. ½ N. From this buoy the *West Corton buoy* (also white) bears N. by E. ¾ E., one mile and three-tenths. Here the mid-channel course will be, more or less, about N. by E., leaving the buoys, as above, on the starboard or eastern side. The breadth of the channel, in this part, is three-quarters of a mile, and the general depths 6 and 7 fathoms. Within this line, on the west, the black mill on Yarmouth Denes, on with the head of the town-jetty, clears the bar which projects from the pier. For sailing along shore, between the Corton and the South Pier-head, the mark is, Nelson's Column or Monument, the hospital, chapel, and church, of Yarmouth, all in one; but here the depth, at low water, will be only two fathoms.

From mid-channel, off the West buoy of the Corton, to a berth off the new pier of Gorleston, the course and distance are N. by E. 3 miles. Here you will have, to the eastward, the N.W. buoy of the Corton, (black) the Light-vessel of St. Nicholas, and the white beacon-buoy of the same, the marks for which have been given in the description of the Gorleston and St. Nicholas' Passages, page 46. The greater part of the channel is a mile and a quarter broad, and the soundings throughout are regular, so that you may, in working, stand to the shore into 5 and 4 fathoms, and to the Corton and St. Nicholas' banks to 8 and 7 fathoms. There is good room for turning to windward, and good anchorage all the way, but the best ground is in 6½ fathoms, with Corton church N.W. by N. and Lowestoff high light S.W. With an easterly wind you may ride nearer to the Corton Sand. With a northerly wind you may ride best to the N.E. of Yarmouth Jetty.

In advancing toward Gorleston, you will see its new pier at the south end of Yarmouth Denes; at a mile more to the north, on the Denes, stands the monument erected to the memory of the late Lord Nelson; the latter is a handsome column, on a broad basement, surmounted by a figure of Britannia, and which, as a mark, is equally ornamental and useful. Yarmouth church is nearly a mile and a half more to the northward, and the town jetty midway between both. Northward of the jetty, on the Denes, are ten windmills.

The anchorage in Yarmouth Roads is off the town. It is so extensive as to admit the largest fleet of ships. The ground is sandy; and ships, in hard gales, sometimes bring home their anchors, particularly if from the N.N.E. or S.S.W.

COCKLE GAT.—From the anchorage in Yarmouth Roads, in 10 fathoms, which is two-thirds of a mile E.S.E. from the town jetty-head, to a fairway off the *Middle Scroby buoy, (white)* the course and distance are N.N.E. 2 miles: thence to a berth within the *North Scroby buoy,* (also *white,*) N.W. by N. a mile and three-quarters: thus they will leave, on the larboard or western side, the two buoys of the *Barber,* described in page 47. Ships bound from Yarmouth Roads, through the Cockle Gat, may pass safely to a berth within the red buoy on the Sea-heads, by keeping Yarmouth jetty, Nelson's monument, and Gorleston barn,* in a line, bearing S.W. ½ S. These marks lead through, in the fairway, between the Scroby and Sea-heads on the east, and the Barber and Cockle on the west.

In working through, with a turning wind, avoid standing too near the Scroby, for it is very steep. So soon as you shoalen your water upon it, you should tack. The flood tide sets strongly over the Scroby, and the ebb over the Barber. After you have passed the buoys of the Scroby, you may stand toward the opposite side into 5 or 6 fathoms; but it is to be observed that, the sands are steep; as, near them, are 10 to 8 fathoms at low ebbs. The passage, in the narrowest part, between the Barber and Tongue of the Scroby, is but half a mile wide; but without, it is three-quarters of a mile in breadth.

From a position between the buoy of the Sea-heads and the south buoy of the Cockle, you proceed to sea on a course N. ½ E.; and, with this course continued for 2½ miles, you will clear the Cockle with its three black buoys, on one side, and some broken uneven ground on the other, which extends about half a league from the Sea-heads to the N. by E., and over which are strong ripplings with the ebb stream. You will now be off Winterton-ness, with the churches of Somerton and Martham in a line, bearing West, and may proceed according to circumstances.

HEMESBY GAT is a new channel, formed by a swash in the sand called the *Barber,* and which is therefore, thus divided into two parts, called the *Inner Barber,* and the *Outer Barber.* On the south point of the latter lies the chequered black and white buoy, mentioned in page 47, and which marks the eastern side of the mouth of the Gatway. The channel within is 3½ miles in length, half a mile broad, and is limited on the west by a long narrow shelf called the *Hood,* extending, parallel with the shore, as far as Winterton lighthouse: the opposite limit is the western edge of the Cockle Bank.

At the entrance is a bar, on which the least depth is two fathoms, at low spring-tide; but within and without are 5 fathoms, deepening northward to 8 and 10 fathoms. The course through is N. ½ E. at three-quarters of a mile from shore.

Off Winterton-ness is a narrow shelf, one mile and a quarter in length, extending S. by E. ½ E. and N. by W. ½ W. Its outer edge is half a mile from shore, and has on it two fathoms of water.

HASBOROUGH GAT, *and the* COAST *thence to* FOULNESS.

The CHANNEL called HASBOROUGH GAT lies between the *Newarp, Sea-heads,* &c. on the S.W., and the shoals called *Winterton Ridge, Hammond's Knoll,* and *Hasborough Sand,* on the N.E. side. It is between 2 and 3 leagues in breadth, and has plenty of water for any ships; 14, 16, and 18, to 20 and 22, fathoms.

The NEWARP and other shoals, on the south side of the Gat, have already been described. Off the north end of the Newarp, at the distance of a mile, is a *light-vessel,* exhibiting *three brilliant lights* upon separate masts, of which the central is the highest. The vessel lies with the Newarp buoy S.W. ½ W. rather more than one mile. When riding ebb, Martham church steeple appears open to the southward of Winterton steeple, twice the breadth of the latter, bearing W. by N.; Hasbro' lower lighthouse just open to the northward of the higher lighthouse; Hasbro' steeple N.W.; Yarmouth church S.W. by W. ½ W.

HASBOROUGH SAND, from a *black buoy,* lying on its south end, to a *black* and *white* buoy, in *quarters,* on its north end, extends N.N.W. 10½ miles: it is nearly one mile across, from 4 fathoms of water on one side to 4 fathoms on the other, at the broadest part; and in some places, it almost dries at low water, spring-tides. This sand, from the north end to within 4 miles of its south end, is steep on both sides: near the north end are, within a quarter of a mile of the outer and inner edges of the sand, from 15 to 17 fathoms of water.

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* Gorleston barn is three-quarters of a mile to the southward of Gorleston church.

From the month of January, 1832, a *light-vessel* has been moored near the north end of this sand, which vessel exhibits *two brilliant lights* on separate masts at 37 feet above the level of the sea. The vessel is moored in 13½ fathoms, with Cromer lighthouse bearing W. by N. 11 miles distant; Hasbro' high lighthouse S.W. ¼ S., north buoy of Hasbro' Sand E. by S. distant about one mile. On the sides of the vessel are the words "*Hasbro' Light.*" The lights may be seen at three leagues off.

From the black buoy, on the south end of *Hasborough Sand,* which lies in 7 fathoms, a narrow shoal of 4, 5, and 6, fathoms, extends 3½ miles N. by E. ½ E., within which and Hasborough Sand the depths vary from 11 to 18 fathoms; and on its eastern edge are 8, 9, and 10, fathoms.

From the same black buoy the bearings and distances to different objects are as follow: The light-vessel off the north end of the Newarp, S. by W., 5¼ miles; the north buoy of the Cockle, S.W. ¼ W., 8¾ miles; Winterton lighthouse, S.W. by W. ¼ W., 9¼ miles; Hasborough high lighthouse, W.N.W. ½ W., 10¾ miles; and Cromer lighthouse, N.W. ½ W., 19¼ miles.

From the quartered black and white buoy, on the north end of *Hasborough Sand,* Winterton lighthouse bears S. by W. ½ W., 15¾ miles; Hasborough high lighthouse, S.W., 9½ miles; and Cromer lighthouse, W. by N., 11½ miles.

HAMMOND'S KNOLL.—This is a narrow ridge of sand, extending six miles N. by W. ¼ W. and S. by E. ¼ E. Its south end, in 6 fathoms, bears S.E. by E. ½ E., 4 miles, from the black or South buoy on Hasborough Sand, and the soundings between are from 14 to 17 fathoms, with sandy ground. The least depths on the middle part of the Knoll, exceed 3 fathoms, in an extent of 2½ miles. The eastern edge is very steep, and rises abruptly from 10 and 11 fathoms.

WINTERTON RIDGE, a shoal bearing a resemblance to Hammond's Knoll, extending nearly in the same direction, and equally steep on the eastern side, lies to the south-eastward of that Knoll, at the distance of two miles. The north end of the Ridge is on the same parallel as the south end of the Knoll: the depths between are 10 and 12 to 17 fathoms. From the north end the Ridge extends S. ½ E. 4 miles.

From the south end of Winterton Ridge, in 5 fathoms, the Newarp light-vessel bears W. ¼ S. 7 miles; and the black buoy on the south end of Hasborough Sand N.W. ½ N. 8 miles.*

HASBOROUGH GAT.—From off Lowestoff, a fair course along the back of the sands to Hasborough Gat-way is N.E. by N. about 4 leagues, until the Newarp light-vessel bears N. ½ E., and Winterton lighthouse, N.W.—A N. by E. course, 5½ miles farther, will bring you up to the eastward of the light-vessel, until the leading mark for the Gat comes on; this mark is, the two lighthouses of Hasborough in one, bearing N.W,

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* SMITH'S KNOLL.—The south end of this bank lies E. ½ S. from Yarmouth, 8 leagues distant, E. ½ N. 7½ leagues from the south end of St. Nicholas' Bank, and E.S.E. 6 leagues from the floating light on the Newarp. Its form is serpentine, but its general direction is nearest to N. ½ W., and its length, from 8 fathoms on each end, is 6 leagues. The shoalest spot on the bank is just in the middle of its length, where two fathoms, near the eastern edge, have been found, and at 2¼ miles each way from this spot are 3½ fathoms. The greatest breadth, near the middle, is about a mile. The general soundings on the Knoll are of fine brown reddish sand with red clay.

On advancing toward the south end, on either side, the soundings are fine reddish sand, with blue clay. The general soundings between it and the Ridge are from 15 to 20 fathoms. The sea hereabout abounds with flat fish.

The eastern side of this Knoll is so steep, that, within three-quarters of a mile of it, in 4 fathoms, there is a depth of 27 fathoms; and ships, coming in from sea, and getting quickly from 29 or 30 athoms into shoal water, will certainly be upon the Knoll; as there is not so deep water to be found any where within it.

Sailing in *through* Hasborough Gat-Way.

In proceeding for the Gat-way from the sea, the first object to be attended to is the light-vessel, which lies off the north end of the Newarp: if you make her to the eastward of North, you must steer to the eastward till you bring her to bear North, or N.N.W. When she bears N.N.W., you may safely steer for her, for the tide runs nearly in that direction; the flood sets S.S.E., and the ebb N.N.W. After passing the light-vessel continue your course N.N.W., or more to the westward, as you shall find occasion, until you see Hasborough lights on with each other; they will then bear from you N.W. a little westerly. If you do not see Hasborough lights, you may take your soundings from the shore in 12, 10, or 8, fathoms. Should you be a mile or two to the eastward of the floating light, in passing it, the tide of ebb will set you in a fair direction through the Gat-way.

If bound for Yarmouth Roads, you must, after having passed the light-vessel, steer such a course as will (allowing for the crossing of the tide) keep her E. ½ S. from you, and you will pass to the northward of the broken grounds extending from the Sea-heads, and toward the north buoy of the Cockle. Hence you may proceed through the Cockle Gat, leaving the black buoys of the Cockle on the starboard side, the red beacon-buoy of the Sea-heads on the larboard, the two buoys of the Barber starboard, and the buoys of the Scroby on the larboard, side. Having arrived between the southern buoys of the Cockle and Sea-heads, the direct course toward Yarmouth will be S.W. ¼ S. with Nelson' Monument on the Denes in a line with Gorleston Barn, which barn stands at two-thirds of a mile southward from the church of Gorleston. It is needless to observe, that this passage ought not to be attempted but in the day-time, when the buoys can be seen.

Sailing out *through* Hasborough Gat-Way.

If, when off Hasborough, you find that you cannot get through the Cockle Gat before dark, you may safely run through the Gat-way, by bringing Hasborough lights in one, bearing then nearly N.W., and then steering to the south-eastward, so as to keep the lights on with each other, which will lead you a mile to the north-eastward of the floating light. As the east side or edge of the Newarp, in 4 fathoms, bears S. by W. from the light-vessel, you must be careful, in rounding her to the southward, not to bring her to the eastward of North, until you shall have passed the light, to the distance of 4 miles: you may then steer S.S.W., which will carry you without the Cross-Sand. If you have a half-flood in your favour, with a brisk breeze, when you pass the floating light, you may steer S.S.W.; for, the flood-tide, by setting S.S.E., will certainly keep you clear of the Newarp. If you should have an ebb-tide, when you pass the light-vessel, you must be sure not to haul up too soon: for the ebb, by setting N.N.W., will sheer you toward the sand; and it may, unless you have a fresh breeze, oblige you to come to an anchor.

If you are off Hasborough, with the wind from the E.N.E.ward, it will not be proper to proceed through the Gat-way with the lights in one, but keep more to windward; and, as the south end of Hasborough Sand bears E.S.E. ½ E. from the great light at Hasborough, you may, so soon as this light bears W.N.W., proceed with it in that direction. Should the wind blow so hard from the eastward, as to render your weathering of the light-vessel improbable, and the keeping clear of the shore until day-light in the morning unlikely, the best way, in such a case, is to anchor off Hasborough, with the light bearing about W. by S. in 10 or 12 fathoms. You will then be above three miles from the shore, or nearly half-way between it and Hasborough Sand. You will ride much better here, under shelter from Hasborough Sand, than you would do off Winterton, being less exposed to the sea, which sets through the Gat-way.

WINTERTON to FOULNESS.—In sailing to the northward, from Winterton-ness, the soundings are regular all the way to Foulness.* The course from Winterton-ness to Foulness is N.N.W., distance 19 miles; between, in the Fair-way, are 10, 11, and 12, fathoms. In turning to windward, you may stand toward the shore to what depth you please, and off to 14, 15, or 16, fathoms; but you must not stand farther off than to 16 or 17 fathoms, or you will be close to Hasborough Sand. The channel, between this sand and the shore, is 7½ miles wide.

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* But there is, at half a league E. ½ S. from Hasborough high light, a small Knoll of 4½ fathoms. the remains of a more extensive shoal.

In the month of May, 1837, the Hon. Corporation of Trinity-House caused a *Buoy*, coloured *red*, to be laid on the outer part of the spit off Cromer, in 3 fathoms, with Hasboro' high light-house, its apparent length open west of Hasboro' church, S.S.E. (S.ly); Cromer light-house W.S.W.; and Beeston church tower, its length open east of Runton cliff, W.N.W.

FOULNESS, near Cromer, is distinguished by a lighthouse of stone, represented in the margin. The building is only 38 feet in height, but the height of the lantern is 274 feet above the sea at high water. It exhibits a brilliant light, which revolves, and shows a face every minute. The light of this important structure may be seen, in clear weather, more than seven leagues off.

Cromer Lighthouse.

In approaching Foulness, go no nearer to it than in 7 or 8 fathoms, as the ground is foul and rocky for a mile from the ness. This foul ground extends thence 5 miles to the south-eastward, and terminates off Trimmingham.

TIDES *between* ORFORDNESS *and* FOULNESS.

At *Orfordness*, the flood-tide continues to run, on the change and full days of the moon, until eleven o'clock, and the water rises 11 feet. The S.W. or flood-stream makes about 24 minutes before low water on shore; and the N.E. or ebb-stream, about 24 minutes before high water. In *Aldborough Bay*, it is high water at forty minutes past ten; spring-tides rise 10, and neaps 6½, feet. Here the flood sets to the S.S.W., and the stream continues to run one hour and a half after the time of high water on shore.

Between Lowestoff and Orfordness the tide along shore sets parallel to the coast, but gales of wind from the N.W. so influence it as to raise the flood from 2 to 3 feet above its ordinary level, and retard the return of the ebb: gales from the S.E. have a contrary effect. Ordinary springs rise from 7 to 8½ feet; neaps from 4 to 4¾ feet.

In *Lowestoff Roads*, it flows at 10 minutes past nine; springs rise 7½, and neaps about 5, feet. The flood, in the passage sets strongly to the S.W. upon the Newcome; and the ebb, contrary-wise, upon the Holm-Head. It sets also nearly in the same direction, or a point more southerly, through St. Nicholas' Gat, and over the Corton.

At Lowestoffness it is high water at 8h. 55m.; but the flood-stream runs to the southward for two hours after. The rise and fall on springs is 8½ feet; neaps, 6 feet.

In *Yarmouth Roads*, it flows at 8h. 40m.; springs rise 8, and neaps 6, feet; but, without the sands, the flood runs until 40 minutes past ten o'clock. In the Cockle Gat, the flood sets strongly over the Scroby, and the ebb over the Cockle and through Hemesby Gat.

The tide sets fairly into, and out of, *Hasborough Gat-way*; the flood S.S.E. southerly, and ends at half past ten o'clock; the ebb runs in a contrary direction. The tides in the strongest springs, run above 3½ knots in an hour; and one tide will carry a ship about 4 leagues: a moderate spring not more than 3 leagues; and neap tides less than 2 leagues. Without Hasborough Sand, the tides do not run so strong, and the flood sets more to the southward. On Hasborough Sand the water rises, at spring-tides, about 10 feet.

Off Hasborough it is high water at 7h. 40m. Spring-tides rise 11, and neaps 7, feet. Here the flood-stream runs to the southward until 10h. 15m.

Off Cromer it is high water at 7h.; but the flood-stream runs to the southward until 10h. 15m. Spring-tides rise 14, and neaps 8½, feet.

Near Winterton Ridge it is high water at 7h. 50m.; but the flood-stream runs to the southward until 10h. 30m. Spring-tides rise 10 feet; neaps 6.

Near Hammond's Knoll it is high water at 7h. 40m.; but the flood-stream runs to the southward until 10h. 30m. Spring-tides rise 9½, neaps 5½, feet.

SECTION VI.

FOULNESS *to* FLAMBOROUGH HEAD *and* SCARBOROUGH, *including the* RIVER HUMBER, &c.

THE navigation of the sea, between Foulness and Flamborough Head, is obstructed by the numerous shoal-banks and over-falls, shown in the Chart, which render it particularly dangerous to cruising ships. The coasts moreover, are generally low; with the exception, however, of the cliff of Hunstanton, and of some other part of the coast of Norfolk; and, also, of Flamborough Head. Near Hunstanton the coast is a cliff of chalk and friable stone, nearly 80 feet in height; and Flamborough Head is a magnificent cliff of white lime-stone, ornamented with a handsome lighthouse, &c.*

DESCRIPTION *of the* SHOALS *between* FOULNESS *and* FLAMBOROUGH HEAD, *including some* Banks *to the* Eastward.

Between Smith's Knoll and Hasborough Sand, which have already been described, and nearly in mid-channel, there is a shoal of 3 fathoms, the south end of which lies with Hasborough lights W. ¾ N. 19 miles; and Cromer light N.W. by W. ½ W. 26 miles. It thence extends N.W. ¾ N. 3 miles; and has, near to the N.W. extremity, 6 fathoms of water.

LEMAN and OWER.—The Leman and Ower are two dangerous banks, which have been growing up for many years, and have now, in some parts, only 5 and 6 feet over them at low water. They lie nearly in a parallel direction, and the inner or western one, which is the *Leman*, is about seven leagues and a half from the nearest coast, or that of Hasborough.

The LEMAN extends in an irregular form, about 15 miles, from N.N.W. ½ W. to S.S.E. ½ E. From its south end, in 4½ fathoms, Hasborough high light bears W. ¾ S., 25 miles; and Cromer lighthouse W. by N. 30 miles. From its north end, Hasborough high light bears S.W. ½ W. 23½ miles; and Cromer lighthouse W.S.W. ¾ W. at the same distance, or 23½ miles.

There are two remarkable elbows formed in this Bank, and both convexing to the S.W.; the southern one is distinguished by its greater convexity, and the soundings of approach to it from the westward, when in a less depth than 5 fathoms, are very irregular; the northern elbow is the shoalest part of the Leman, and here a depth of 5 feet only, for a superficial extent of about a square quarter of a mile, exists. Between these elbows, the prevailing depths are from 11 to 13 feet, and from each of them to the corresponding extremes of the bank, the depth gradually increases to 4 fathoms, and thence to 6 and 7 fathoms.

A vessel, in nearing the Leman from the westward, may, by keeping her lead going, have warning of her approach to it; but not in coming from the eastward; for the bank on this side is so extremely steep-to, that she may strike the ground before soundings by the lead can be obtained, particularly with a flood-stream running. It is a very remarkable feature of this bank, that throughout its whole extent, the shoalest water is on its extreme Eastern edge, so that, in crossing it from the westward, so soon as the shoalest water is obtained, the lead will immediately go down into 18 and 20 fathoms near the Southern end; into 13 and 14 fathoms between the elbows; and into 15 and 16 fathoms near the northern end: the steepest part of the bank being near the southern end, where 23 and 24 fathoms are to be found within two cables' length of it.

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* FLAMBOROUGH HEAD was the *Fleamburg* of the Saxons; and received that appellation from the flames which were kindled on its summit to direct the landing of Ida, who, in A.D. 547, joined his countrymen in Britain, with a large reinforcement from Germany, and founded the kingdom of Northumberland. In the reign of Edward the Confessor, Flamborough was one of the manors of Harold, then Earl of the West Saxons, but afterward King of England. On his demise, William the first bestowed it upon Hugh Lupus, who left it as a perpetual alms to the Monastery of Whitby. The cliffs are of stupendous height. Beneath are several vast caverns, some closed at the end, others pervious, formed with natural arches. In many places the rocks are insulated, and of a pyramidal figure, soaring up to a vast height. The bases of most are solid, but in some pierced through and arched. The colour of all these rocks is white, from the dung of the innumerable flocks of migratory birds, which quite cover the face of them, filling every little projection, and every aperture that will give them shelter.—*History of the County.*

When the stream of tide is running, (ebb particularly,) if the Leman does not show itself by breakers, occasioned by a running sea, it will be sure to do so by a "*smooth and rippling;*" and so remarkable is this effect, caused by an increased velocity of the stream of tide over the shoal eastern edge, that, from the mast-head in moderate weather, the bank is strongly marked out as far as the eye can reach either way, and the elbows are so well delineated, that, by the difference in their convexities, and the direction of the neighbouring "smooth and rippling," they are readily distinguished from each other, and serve as a most excellent departure.

It is high water on the Leman, on full and change of the moon, at 6 o'clock, at which time the flood-stream runs in its full strength, namely, two miles per hour, in a S. ½ W. direction. This stream then gradually inclines to the westward, or with the motion of the sun, until full three hours ebb, when it is found to run S.S.W. ¼ W., and its strength is diminished to three quarters of a mile per hour. It shortly afterward becomes slack, and so continues until five hours ebb, when the ebb-stream springs up N.N.W. ¼ W. veers round to the northward, and increases in strength, until a little after low water, when it is found to run N. ½ E. in its full force, at two miles per hour. It then inclines to the eastward, and diminishes in strength until four hours flood, when it is lost in the E.N.E.

As a summary with respect to the tide, it may be observed that, the flood-stream springs up S.S.E. ¼ E., and terminates S.S.W. ¼ W.; that the ebb-stream springs up N.N.W. ¼ W., and terminates E.N.E.; that it is high and low water when the respective streams are running in their full strength; and that it is slack water by the stream, between the third and fourth hours of flood and ebb.

It is worthy, also, of particular remark, that the stream of tide runs *directly across* the shoalest parts of the Leman, and at double the regular velocity, but it immediately resumes both the former direction and velocity again.

The OWER is, by far, more dangerous and irregular than the Leman. This bank has likewise, two remarkable elbows, which lie in one parallel of latitude; but unlike those of the Leman, the eastern of these two convexes to the N.E., the western to the S.W.; by this difference, and their relative bearings, they may readily be distinguished from those of the Leman, and from each other; that is, when breakers, or the strength of the stream, cause the back and these elbows to show themselves.

The Southern extremity of the Ower bears from that of the Leman N. by E. ¾ E. 4½ miles; the Northern extremity from that of the Leman N.E. ½ E. 4 miles; and the shoal patch of the Ower, from that of the Leman (the nearest parts of the banks) N.E. by E. ½ E. 3 miles.

From the north end of the Ower, Hasborough high lighthouse bears S.W. ¼ W. 9½ leagues; and Cromer lighthouse W.S.W. 9¼ leagues.

From the Southern end to the Eastern elbow, the Ower, like the Leman, has its shoalest water on the extreme Eastern edge, the prevailing depths being from 11 to 15 feet. This shoal ridge extends thence *across* the bank to the Western elbow, and there terminates in an extensive patch of 5 feet, which is very steep-to on the *Western* side. To the northward of this patch the bank is more regularly formed; still, however, the Eastern side throughout is the steepest and the most difficult to approach by the lead. In the middle of the bank, and at half a mile north of the shoal patch, there is a hole of 4½ fathoms, with 2½ fathoms on either side. At a mile and a quarter N. by W. ½ W. from the same patch, there is a shoal part of some extent, with only 11 feet on it, and which shows very conspicuously by breakers, when the sea is running.

That portion of the bank between the Southern end and Western elbow shows itself by "*smooth and rippling,*" during the strength of the stream, in the same remarkable way that the Leman does; but to the northward of this elbow, it is not so strongly marked, by reason of the more regular formation of the bank, and the stream of tide not setting so obliquely upon it.

It is high water on the Ower, at full and change of the moon, at half-past six o'clock; the flood-stream runs in its full strength, two miles, S. by W. at one hour after high water, then veers round toward the West, as at the Leman, and terminates in the S.W. by S. at 3½ hours after high water. The ebb-stream commences at 5 hours ebb, in the N.W. by N., is in its full strength at two miles per hour, and running N. by W. ¼ W., at one hour after low water, and terminates in the East at 4 hours flood. The flood-stream commences at 5 hours flood, S. by E.

A singular peculiarity in the tide about the Ower was observed; there was no sensible *rise* in the tide until 3 hours after low water, and when the ebb-stream was nearly done, a sudden rise of 5 or 6 feet took place, so that nearly the whole rise of tide occurs in the last three hours of it.

The stream of tide runs over the shoal ridge of the Ower, as at the Leman, with an increased velocity, equal to nearly double its natural strength.[*]

To the EASTWARD of the OWER, there are three similar parallel ridges, between it and the Well Bank, the least depth on either of which is about 5 fathoms. The first is four miles from the Ower: in the channel between there are from 17 to 24 fathoms; and, in general, good anchoring ground.

HADDOCK BANK.—At about 4 leagues N. by E. ½ E. from the north end of the Ower, and 12 leagues N.E. ½ E. from Cromer lighthouse, lies the south end of the Haddock Bank, extending thence 6 miles N.N.W. ½ W. It is 1½ mile broad, and has, on the middle part, about 5 fathoms; increasing, to each end, to 6 and 7 fathoms of water. Near it, on each side, are 14 fathoms. Between this and the Ower are from 14 to 24 fathoms. N. ½ W. 14 miles from the north end of the Haddock Bank, and N.N.E. ¼ E. 50 miles from Foulness, lies the *N.N.E. Hole*, in which there is a depth of 40 fathoms. Between this and the Haddock Bank are from 15 to 20 fathoms.

CROMER KNOLL.—At about 2½ leagues N.W. by N. from the northern extremity of the Leman, and 7½ leagues N.E. by E. from Cromer lighthouse, lies the South end of the *Cromer Knoll* or *Outer Bank*. This shoal thence extends N.W. about three miles, and has on it, according to the only account of it which we possess, from 2½ to 3½ fathoms.

CROMER BANK.—At 4 leagues N. by W. from the north end of Hasborough Sand, and 13 miles N.E. from Foulness light, lies *Cromer Bank*, which extends about 3 miles N.W. and S.E. It is nearly a mile in breadth, and has, on the middle part 4, on its north end 6, and on its south end 7, fathoms, at low water. Between this and the Knoll are 17 fathoms; between the Bank and Hasborough Sand are 12, 20, and 18, fathoms; and, between it and Foulness, are 16, 18, 16, 12, and 9, fathoms, at low water.

SHERINGHAM SHOAL.—At the distance of 5½ miles from the coast westward of Cromer, and nearly parallel thereto, the *Sheringham Shoal* extends N.W. ½ W. 6 miles. The depths on its eastern part, to the distance of a mile, are from 4 to 6 fathoms; those on its western part, to the distance of two miles, or rather more; but, on the central part, the depths vary from 20 to 14 feet, and in some spots to 12 feet, of water. In 1827 a *black* buoy was laid on its eastern part, in 4 fathoms, which lies with Cromer lighthouse nearly South, 7½ miles; Blakeney church W. ¾ S. 9 miles; and the village of Lower Sheringham S.W. by S.

A swash of 3 fathoms, nearly two miles from the buoy, lies with Weybourn church and mill open with each other, and bearing S.W. ¾ S.

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[*] The Leman and Ower were surveyed, in 1826, under directions from the Lords of the Admiralty, by Captain Wm. Hewett, whose remarks are included above. The positions, as given by Capt. Hewett, are as under:—

Southern extremity of the *Leman*, (4 fathoms,) latitude 53° 2′ 50″, longitude 2° 7′ 45″ E. Northern extremity, latitude 53° 10′ 10″, longitude 1° 50′ E.; Northern Elbow, (5 feet,) latitude 53° 8′, longitude 1° 53′ 45″; Southern Elbow, (2½ fathoms,) latitude 53° 5′, longitude 2° 1′ 30″.

Of the *Ower*, the Southern extremity, (4 fathoms,) is in latitude 53° 7′ 30″, longitude 2° 6′ 45″; the Northern extremity, (same depth,) latitude 53° 14′, longitude 1° 53′: Western Elbow, (5 feet,) latitude 53° 10′ 30″, longitude 1° 57′; Eastern Elbow, (2 fathoms,) latitude 53° 10′ 30″, longitude 2° 1′. In all these longitudes it is assumed that the Spurn lighthouse, from which all the meridional distances were measured, stands in 0° 7′ 15″ E.

[Blakeney Overfalls, &c. are described hereafter, in the Directions for proceeding to Lynn Deeps.]

DUDGEON.—At the distance of 9 leagues N. ½ W. from Foulness, is a light-vessel, which rides a little to the westward of a shoal called the *Dudgeon*. This vessel formerly exhibited two lights in the night; but, as one brilliant light has been considered more effective, such a one has, by order of the Trinity-house, been exhibited since the 25th of July, 1826.

The direction of the Dudgeon is N.N.W. ½ W. and S.S.E. ½ E. It is about 4 miles in length, and one mile in breadth, and has, on its shoalest part, which bears from the light-vessel E. by N., about three-quarters of a mile, 10 feet at low water. On the other parts are 2 to 4, 5, and 6, fathoms. To the N.N.W., at the distance of about a mile and a half from the N.W. end of the Dudgeon, is a small overfall, of 3 fathoms.

From the Dudgeon light to that on Flamborough Head, the bearing and distance are N. by W. 20 leagues.

RACE'S BANK.—To the West and S.W. of the Dudgeon is a shoal called *Race's Bank*, first discovered in 1801.

Since the original notification of this shoal, it has appeared, from soundings taken by Mr. Holditch, that it has grown up, until there is, in one spot, only a depth of 2 fathoms, and the gentlemen of the Trinity-House have ascertained that it now occupies a space of two leagues and a half in length, from N.N.W. to S.S.E.; in consequence of which, in March, 1826, a buoy was placed near each end. Of these, that on the southern end is *white*, and that on the northern end *red*. The first, or white buoy, lies in 4 fathoms, with the Dudgeon light-vessel bearing N.E. by N. distant about 4½ miles; and Blakeney church bearing S. by W. Just within this buoy are only 3 fathoms of water.

The *red buoy*, on the northern end, lies in 4½ fathoms of water, with the Dudgeon light-vessel bearing E.S.E. ½ E. about 6¼ miles. The depth, likewise, just within this buoy, is 3 fathoms. The general depths between the Dudgeon and Race's Bank are 9, 10, and 12, fathoms.

OUTER DOWSING, &c.—The south end of the Outer Dowsing lies about 35 miles N. ½ E. from Foulness; and the shoal extends 5½ miles N.W. by N. and S.E. by S. It is more than half a mile broad, and has, on its south end, 6 fathoms; on the middle 4, and, on the north end, 2, fathoms at low water. Near the bank, on the west side, are 8 and 7 fathoms, and, on the east side, 9 and 10 fathoms, at low water.

N.W. 4 miles from the north end of the Outer Dowsing, lies a small shoal, of 3 fathoms at low water; and, 6 miles farther, N.W. by W., lies the Little Silver-pit, with from 20 to 40 fathoms of water. Between this pit and the shoal, are 15 and 16 fathoms at low water.

INNER DOWSING.—Thirty-seven miles N.N.W. ¼ W. from Foulness, 13½ miles N.W. by W. from the Dudgeon, 20 miles S. by E. ¼ E. from the Spurn Point, and 9 miles E. by S. from Thrusthorpe, lies the north end of the Inner Dowsing, on which a *black buoy*, with a *staff and vane*, was placed in 1826, in a depth of 3¼ fathoms. The sand thence extends 6½ miles S. by W. ½ W., and, in the middle part, is nearly a mile broad. The least water on this sand is 7 feet, at low water; although, close to it, on the west side, are 10 fathoms; near the east side are 8 fathoms; and near the south end 4 fathoms. Near the north end are 8 fathoms of water. The south end lies 9 miles E. by S. from Ingoldmell church; between are 10, 9, 8, 7, 6, 4, and 3, fathoms, at low water.

The DOCKING SAND, which formerly appeared under the figure of a number of detached overfalls, now forms a regular bank, the southern side of which trends 6 miles in a N.W. by W. and S.E. by E. direction, with Addlethorpe church bearing nearly N.W. ¾ W.

At a mile to the S.W. from the S.W. end of the bank is a *red beacon-buoy*, first laid down in November, 1828, to mark the northern extremity of the Burnham Flats. This buoy lies in 4 fathoms, with Addlethorpe church about twice its apparent breadth to the northward of Ingoldmell church, N.W. ½ W. distant 11½ miles; Lynn Well light-vessel W.S.W. ¼ W., 10½ miles; Hunstanton lighthouse S.W. ¼ W., 12½ miles; Brancaster high mill S.S.W., 11½ miles; Holkham church S. ¼ E., 12¾ miles; and Blakeney church S.S.E. ½ E., 18½ miles.

The shallowest and nearest part of the Docking Sand, a portion of which is nearly dry at low water, bears from the buoy from N.E. by E. to E.S.E. ½ E. one mile; and this is the extreme breadth of the channel, the navigation of which it is the object of this buoy to facilitate. The depth on the bar, which connects the Burnham Flats with the Docking Sand, is 5 fathoms.

Addlethorpe and *Ingoldmell* or the *Sister Churches* in one, and bearing N.W. ¼ W., do not, as formerly represented, lead to the northward of the shoalest part of the Docking, for that line of direction does really cut off a considerable portion of the northern end of Burnham Flats, and leads over at a mile to the southward of the buoy, where, at the shoaler part, there is only 9 feet of water.

The North end of the Docking is distinguished by a *black and white chequered buoy*, which was placed there by order of the Trinity-House, in June, 1827, in 4 fathoms of water, with Hunstanton lighthouse bearing S.W.; Ingoldmell church W.N.W. 11¾ miles distant; and the red buoy on the north end of Race's Shoal, N.E. by E. about 6 miles distant.* The shoal hereabout is very steep-to, having close to its N.W. side a depth of 10 fathoms, at about two cables' length from the buoy.

The BURNHAM FLATS are extensive grounds, which constitute the base of numerous shoals to the northward of the coast, between Wells and Hunstanton, and forming the east side of the great entrance to Lynn Deeps. The great Flat is of a triangular form, and spits which extend from it eastward are called the *Blakeney* and *Stukey Overfalls*. Its north point is shown by the red beacon-buoy above described. On the western side are the shoals named the *Woolpack*, the *Middle Bank*, and *Sunk*. On the south is the dangerous shoal called the *Bridgirdle*, beyond which, westward, extending a league and a half, is a tract of deeper water, called *Brancaster Roads*, and beyond this is a smaller tract, of a similar description, called *The Bays*, which serves as an in-shore passage for small vessels, to Lynn Deeps, between the Sunk and Middle Bank, on one side, and the land on the other, called the *Gore Point*.

The WOOLPACK, lying on the western side of the Flats, has its southern edge at 6 miles from Hunstanton lighthouse, with that object bearing from S.W. by W. to S.W., and a great part of it is dry at low water. The MIDDLE BANK lies between the Woolpack and Sunk, and some part of it dries 5 feet above water at low springs. The SUNK, more to the S.W., dries to the same height. Off the S.W. end of the latter is a *red beacon-buoy*, which lies with Hunstanton lighthouse bearing S.E. ¾ S. nearly three miles distant, and is the first buoy on the eastern side of LYNN DEEPS.

FOULNESS *to* LYNN ROAD *and* BOSTON DEEPS;

including BLAKENEY, *&c.*

BETWEEN Foulness and Blakeney, several parts of the coast are foul and rocky; as near Cromer, Sheringham, and Weybourn. From Cromer lighthouse the coast to Lower Sheringham rounds N.W. and N.W. by W. 4 miles, and it continues, in the latter direction, 2½ miles farther, to the mill and church of Weybourn. At two miles westward of Weybourn is Salthouse; and at 2½ miles westward from Salthouse, the church and mill of Blakeney, which stand at nearly three miles S.S.E. from the entrance of Blakeney Harbour.

Off Salthouse, at the distance of half a league from shore, is a bank of 2 and 3 fathoms, called the *Pollard*, which is a mile in length from E.S.E. to W.N.W. There are 5 and 6 fathoms between it and the shore, and between it and Sheringham shoal 8, 9, and 10, fathoms. From the S.E. point Salthouse church bears S.W., and Blakeney church W. ¾ S., 3¾ miles.

The spit of sand, called BLAKENEY OVERFALLS, stretching to the eastward, (S.E. by E.) from the Burnham Flats, and nearly parallel with the coast between Blakeney and Burnham, is about three miles from the low water mark of the shore. Its eastern extremity lies with *Kelling and Salthouse Churches* in one, bearing S. ½ E. From this extremity the depths, to three miles westward, vary from 4 fathoms to 10 feet; but beyond this, to the west, is the KNOCK, which has on it, in one spot, only 8 feet of water.

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* The red beacon buoy on the north end of Burnham Flats bears S.W. ¾ S. 3¾ miles from the Docking buoy.

The STUKEY OVERFALLS extend in the direction of the coast near Wells, like a middle ground between Blakeney Overfalls and the shore: the channel-way between them and the former is a mile wide, and its depths are 9, 8, 7, and 6, fathoms; while the Stukey Overfalls, on the south side of the channel, have only from 3 fathoms to 13 feet of water. A basin off Wells, on the south of them, three miles long, has from 4 to 5 fathoms.

BLAKENEY HARBOUR.—This harbour, and that of Wells, are the only safe retreats for vessels taken in a gale blowing upon the adjacent coast. Blakeney has a bar-harbour, and the tide flows, on the full and change, at six o'clock; but, without it, the stream runs to the southward three hours longer, which must be particularly attended to when going in.

If a ship be caught by a hard gale of wind at North or N.E., she may run boldly in, with sufficient tide, having the church at S. ¼ W.; and, when within two miles of the shore, bringing the church to S.W. ½ W. will run her to the first buoy.

The entrance bears from Foulness N.W. by W., distance 4½ leagues; and, from the floating light of the Dudgeon, S. by W. ½ W. 7 leagues. The church, in a clear day, may be seen from the float. The channel, at the entrance, is one-third of a mile wide, and is marked out by buoys on the western side. The sand, on both sides, is dry at low water; and, on that on the starboard, are five black buoys, with a beacon within, standing nearly a mile within the entrance. At one-quarter of a mile E.S.E. from the beacon, on a shoal spot in mid-channel, is a white buoy, to the eastward of which the water is shallow, although above it is good anchorage. The water is deepest with a strong northerly wind. In making the harbour, with a westerly wind, keep westerly, as the flood-tide sets strongly to the eastward, to within the second and the third buoy. The harbour is safe for ships of 400 tons, in a gale of wind dead on the coast; and, when boats cannot get off, a flag is hoisted on the church, as a signal to denote that ships may run for the harbour.

A Signal-pole is erected on the point: one ball denotes 8 feet of water; two balls, 10 feet; and three balls, 12 feet. The same signals, with a flag over them, denote the depth over the *East Low*, which is not buoyed. In case of emergency, attend to the waving of flags by pilots on the point.

In entering the harbour, leave the first buoy within a ship's breadth on the starboard side; or, with a scant wind at N.W. or W.N.W., and a flood tide, you may go to windward of it. From the first to the second and third buoys, the course is S.S.W.; you leave them all on the starboard side. After running a tow-line's length above the third buoy, let go your anchor toward the beacon, and moor to the southward. The bar, at low water, spring-tides, is sometimes nearly dry; but, in strong north winds, the water rises 20 feet perpendicular. Be careful to allow for tide, with the wind at W.N.W., as the flood then sets you to leeward.

The preceding directions are copied principally from those printed by authority at Blakeney: the following remarks have been communicated by *Mr. Holditch*.

"The bar of Blakeney, although buoyed out tolerably regular, is a very dangerous one for strangers to attempt, as it often shifts. Sometimes there are 6 or 7 feet over it at low water, and at other times not more than one or two. However, it may be said that, in a heavy gale of wind from the eastward, and you cannot clear the land upon either tack, it is much better to take it than to run the risk of being driven on shore. It flows here at about three-quarters past six, on the full and change of the moon, and runs to the south-eastward 3 hours after high water. In running for the harbour, from the *westward*, keep Blakeney church about S.E. by S. until you see the buoys. The outer one lies on the middle of the bar. After passing this, run from buoy to buoy, until you get into the harbour between the two points within the Hood, and then bring up. Here you will have from 7 to 9 feet at low water. The flag is hoisted on the church when there is a depth of 9 feet of water on the bar."

WESTWARD OF BLAKENEY, between it and Wells, is a shelf of sand, about a mile broad, stretching off from shore, and toward which vessels ought not to approach nearer than in 4 fathoms.

WELLS HARBOUR.—The entrance of this harbour lies 5¼ miles N.W. by W. from that of Blakeney. It has been much improved, and is said to be, at present, nearly equal to the former. A red buoy, as a fairway buoy, marks the entrance; and, within this, seven black buoys, on the edge of the western bank, denote the channel-way into the harbour; and, on the opposite side, are three white buoys, for the same purpose.

Two large and conspicuous beacons, which in a line bear S. by W., lead in a fair berth to the outer buoy, which is to be left on the starboard hand; and, having run from buoy to buoy, to the fourth black buoy, you will have two other beacons in a line, on which lanterns are kept lighted in the night. These beacons in one, bearing S. by W. ¾ W. lead up above the buoys, and to the *Sculp Beacon*, the first of the two beacons here alluded to, and which stands on the edge of the sand. But, having advanced to the last black buoy, you will be directed upward, by two smaller beacons, which in a line bear S. ¼ E., until two others come on, bearing nearly S.E. The latter lead up into the harbour, toward a sunk beacon, which is to be left on the starboard side, and to the north-eastward of which there is anchorage for light ships in soft mud.*

The tide flows on the bar at six o'clock on the full and change; but, as at Blakeney, runs to the eastward three hours after. The harbour is nearly dry at low water; but spring-tides rise generally from 16 to 18 feet.

It is particularly to be observed, that, in entering the harbour, sufficient allowance must be made for the tide, as the flood sets very strongly to the eastward.

In WELLS' ROAD, or Holkham Bay, vessels may anchor in 3 fathoms, at low water, about a mile and a half from shore, with Wells church S. by E., Holkham church S.W. ¾ S., and the north part of the Scald-heads, a range of sand-hills on the shore, W.N.W. Also, in 4 and 5 fathoms, good ground, at a mile more to the north-eastward, with Wells church S. ¾ W., and Holkham church S.W.

Here you will be in sight of the beautiful estate of the Earl of Leicester, including *Holkham Park*, between Wells and Burnham, with its obelisk, &c.†

The BRIDEGIRDLE or Bridgirdle, a shoal partly dry at low water, lies to the northward of Burnham, at nearly a mile from the shore. It is in a horse-shoe form, extends a mile and a half from S.E. by E. to N.W. by W., and is nearly a mile broad. Between the shoal and shore are from 9 to 3 feet only at low water, spring-tides. With Holkham Church and Obelisk in one, S. ½ W., you will be clear of its eastern end, in 2 and 3 fathoms.

Coasters, who are acquainted with the navigation of this part, on proceeding for Lynn from the eastward, commonly pass between *Burnham Flats* and the *Bridgirdle*. The course to this passage, from Blakeney and Stukey Overfalls, is W.N.W. ¼ W. distance 7 miles; that is, commencing when Blakeney church bears S. by E. ½ E. 5½ miles distant, and Wells church S.W. ¾ W. You may know when you have advanced to the Bridgirdle, by the mark above-mentioned, Holkham church and Obelisk in one.

When Brancaster Mills, between the church and signal-staff, bear S.W. by W. ¾ W., you will be off and near the N.W. extremity of the Bridgirdle, and may thence proceed W. by N. 3 miles, into Brancaster Roads, until the church and mills, in a line, bear S.S.W. ½ W. At this spot are fine light sand, and 13 to 15 feet at low water. Here, should the tide require it, you may anchor. Proceeding hence W.N.W., 2½ miles, you again cross the bank, and reach '*The Bays.*' Here you have 2½ fathoms, with Hunstanton lighthouse S.W. by W. ¾ W., and Brancaster Mills midway between Tichwell and Brancaster churches S. by E. ¼ E.

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* A useful Chart of Wells Harbour has been published at Wells, by *Mr. Race*, master of the Dudgeon light-vessel. From this Chart it appears that the first beacon within the harbour, which is called the *Scalp Beacon*, stands on the edge of the sand, at a quarter of a mile within the innermost black buoy. It exhibits a lantern-light in the night, as above-mentioned; and, when in a line with a similar beacon with a lantern, bearing S. by W. ¾ W., leads directly to the mouth of the harbour.

The next beacon is elevated on the knoll called Cape Hill: and, over its triangular head, a ball is hoisted, when there is water at the entrance for vessels drawing 10 feet. This beacon in one with the larger beacon appearing within it, and bearing S. by W., leads a ship in a fair berth to the outer buoy.

Inner beacons.—Two pair of beacons, within the above, serve to lead up the harbour, as described.

Should the harbour alter, the beacons will be moved, from time to time, so as to form proper marks.

† This singular district deserves notice. In the year 1776 Mr. Coke, now Earl of Leicester, came into possession of the Holkham estate. Not a grain of wheat had then been sown between Holkham and Lynn, and 10,000 quarters were annually imported at Wells for the consumption of the surrounding country. In 1828 the exportation of wheat amounted to 50,000 quarters. In 1776 the inhabitants was 176; in 1828, 1,100. In 1776, 4,000 acres maintained 800 sheep; in 1828, 2,000 acres fed 3,500. In 1776 there were three farm-yards on the 4,000 acres; there are now 20 on the 2,000.

From the last mentioned spot, the course and distance through *The Bays* are West, 6 miles, which will lead over the bank and to the southward of the *Sunk Buoy*, noticed on page 57. In this course you leave the *Middle Bank* and *Sunk* on the starboard or north side.

Thus, with the tide, you may gain Lynn Deeps: but it is a passage not to be recommended to strangers.

Near and upon the edge of the bank, at 2 miles S.S.W. ½ W. from the Sunk Buoy, is the *black beacon buoy of the Ferrer*, lying with Hunstanton lighthouse E. by S. 2¾ miles. The depths near the edge of the bank are from 4½ to 6 fathoms. Hereabout you may have a pilot.

The pilot sloop may be known by its broad vane; and if a red or blue jack be hoisted under the vane, it signifies that you are to make sail toward the vessel.

MIDDLE CHANNEL to LYNN DEEPS.—*From Brancaster Roads*, you may pass into Lynn Deeps through a sledway which exists between the *Middle Bank* and *Woolpack*. Starting from the spot whence Brancaster church and mills are in one, your course and distance to gain the Deeps will be N.W. ¼ N. 4½ miles. The general depth over the bank is about 9 feet, at low ebbs. At the outlet you will be five miles to the E.N.E. from the buoy of the Sunk, and have 6 fathoms of water.

DOCKING CHANNEL.—This channel to Boston and Lynn Deeps lies between the Docking Sand and Burnham Flats, and its N.W. extremity is denoted by the red beacon-buoy, of which the marks are given on page 56. In order to take this channel, you may run out, over the tail of Blakeney Overfalls, with the churches of Salthouse and Kelling in one, bearing S. ¾ E. until you have advanced to the depth of 9 or 10 fathoms, sand and shells, about 7 miles from shore; whence Wells church bears S.W. by W. ½ W. The course hence will be N.W. ¾ W. 6½ miles, toward Burnham Flats, where you have 5 fathoms, coarse brown sand and shells.* From the last spot, the direct course to the Bar, between the Docking and Burnham Flats, is N.W. by N., and the distance 8 miles, here the depths are 5 and 6 to 10 fathoms, leaving the buoy on the south or larboard side.

The N.E. CHANNEL to Boston and Lynn Deeps is that between the Docking and *Inner Dowsing*. The last-mentioned sand has been described in page 56. The chequered buoy on the north end of the Docking is, of course, to be left on the larboard or southern side. From Cromer lighthouse the bearing and distance of this buoy are nearly N.N.W. ¾ W. 28½ miles. You may cross over the western part of Sheringham Shoal, in 6 or 7 fathoms, with Cromer lighthouse bearing S.S.E., and the course thence will be N.W. by N. Having passed the Docking Buoy *(chequered)* the course into Lynn Deeps, passing the beacon buoy of Burnham Flats, will be S.W. and S.W. by W. until you come in sight of the light-vessel, stationed in Lynn Well, between the Middle Bank on one side, and Long Sand on the other.

LYNN DEEPS IN GENERAL.—The Estuary bearing this name is bounded on the east, as already stated, by the Docking Sand, Burnham Flats, and other shoals; on the west by the sands forming BOSTON DEEPS, called the *Dog's Head*, the *Long Sand*, the *Roger*, the *Gat Sands*, &c.; on the south by the banks forming the channels to the ports of Lynn, Wisbeach, &c., which channels are narrow and intricate. Many of the banks are dry long before low water; as, for instance, the *Dog's Head*, the south part of which is elevated 6 feet above the surface at low spring-ebbs: the eastern side of the *Long Sand*, 8 feet; although, at a short distance without, there are 9 fathoms of water; the N.E. part of the *Gat Sand* 8 feet; and part of the southern shoals appear, at times, from 8 to 14 feet above water.

The LIGHT-VESSEL, above-mentioned, was placed in Lynn Well, by order of the Corporation of Trinity-House, London, in February, 1828. It lies at a mile S.E. from the Hook of the Long Sand, and exhibits two lights, from separate lanterns of equal height. From the beacon-buoy, on the north end of Burnham Flats, the vessel bears W.S.W. ¼ W. 10¾ miles. From the light-vessel, Boston steeple bears W.N.W. ¼ W.; Snettisham church

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* From this spot Holkham church bears S.S.W. ½ W., and Brancaster Mills, S.W. by W. ¾ W.

S. ¼ W.;

S. ¼ W.; and Hunstanton lighthouse S. ¾ E. Those coming into the Well from the Lincolnshire coast should bring the light-vessel to bear S.W. by W., which will carry them nearly a mile to the eastward of Lynn Knock; and, after rounding the vessel to the southward, allowing for tide, they may steer W.S.W. ¼ W., 5 or 6 miles, and anchor for the night, with the vessel E.N.E. ¼ E., in 9 or 10 fathoms, at low water. The flood sets W. by N., spring-tides 4 or 5 miles an hour.

PORT of LYNN.—Since May, 1812, the old channel of Lynn, having grown up, has been totally disused; and, fortunately, the Western Channel, now the only one, has greatly improved, and is, throughout, regularly and closely buoyed.

The outer banks forming this channel are the *Roaring Middle* on the east, and the *Bell Sand* on the west. The N.E. extremity of the Roaring Middle is 5½ miles S.W. by W. from the light-vessel in the Well. At a mile farther, in the same direction, the shoal has, on its western edge, a buoy, painted *black* and *white*, in quarters; and, at two-thirds of a mile beyond this, a *black* beacon buoy. Three other black beacon buoys, on the same side, succeed, within the distance of 2¾ miles.

On the opposite or western side of the channel, between the second and third black beacon-buoys of the Roaring Middle, is a *black* buoy, called *Wisbeach Bar Buoy;* and between the third and fourth, on the Bell Sand, is the *Bell Buoy,* which is *white,* with a *staff* and *vane.*

Opposite to the fourth black beacon buoy is a *white* buoy, off the N.E. point of the *West Mark Knock.* On the bank, at half a mile N.W. by W. from this buoy is a life-beacon. Thus, in passing, these objects appear in a line.

The direction of the channel, to the buoys last mentioned, is S.W. ½ W., and its length from the first buoy, 3¼ miles. It thence rounds more to the eastward, and serpentines up to Lynn, in a distance of 11½ miles. The succeeding buoys, &c., are as follow:

Whiting, first buoy, *black,* larboard side.—Westmark Knock, second buoy, *white,* starboard.—Whiting, second buoy, *black,* larboard.—Breast, *white* beacon buoy, starboard.—Thief Sand, *black* buoy, larboard.—Thief Sand, life-beacon,* larboard.—Old Boat Knock, *white* beacon buoy, starboard.

The last three are within a quarter of a mile of each other, upon a very contracted passage, which may be considered as the bar of the river, on which are only 9 feet at low water. The direction of the channel here is S.W. and S.W. ½ S. A part of the Thief Sand dries, at low spring-ebbs, to the height of 9 feet above the surface of the water. The channel hence northward, to the Deeps, increases in depth, and has from 3 to 7 fathoms, good ground of clay and sand.

Blackshore, first buoy, *black,* larboard.—Old Boat Knock, second, *white beacon buoy,* starboard.—Blackshore, second buoy, *black,* larboard.—Blackshore, third buoy and a beacon, *black,* larboard. Old Boat Knock, third white beacon buoy, starboard.

The last two are nearly opposite to each other. Depth between, 12 feet.

Blue Moorish, first and second buoys, *black,* larboard.—Old Boat Knock, fourth buoy, *white,* starboard.—Daseley's Beacon on Blue Moorish, larboard.—Pendoor Sand, first buoy, *black,* larboard.—Old Boat Knock, fifth buoy, *white,* starboard.—Pendoor Sand, second and third buoys, *black,* larboard.—Breast Sand, first buoy, *white,* starboard.—Peter Black, first buoy, *black,* larboard.—Breast Sand, second buoy, *white,* starboard.—Peter Black, second buoy, *black,* larboard.—Breast Sand, first and second beacons, starboard.—Peter Black, third buoy, *black,* larboard.—Breast Sand, third and fourth beacons, starboard.

Here the channel winds more to the east, and the remaining buoys up to Lynn are uniformly black on the east or larboard, and white on the west or starboard, side. To the

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* Of this beacon, the height above the level of the sea is 34 feet, and above the low-water mark 38 feet, and it stands at 300 yards from the depth of 3 fathoms at low water. The chains by which it is supported are fastened to stones, eight in number, and each of 6 *cwt.* The mast is furnished with a chain and cleats, by which persons may ascend for safety, in case of shipwreck, and it has a round top, 6 feet in diameter, which is railed round, and adapted to the preservation of such persons. On the summit is a large triangular vane, of two feet, which may be seen from every point of the compass. At the distance of two or three miles the beacon appears like a sloop at anchor, without a top-sail yard, and a vessel may be guided, by its bearings, up to the Road.

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distance of four miles below Lynn there is, in general, only one foot of water at low spring-tides. *For the Tide Lights*, see the preceding description of Lighthouses, &c.

WISBEACH EYE.—The entrance of WISBEACH EYE, from Wisbeach Bar buoy, above mentioned, extends W. ½ S. one mile W.S.W. to the same distance, and then the Eye nearly S.S.W., 3 miles. The *Bar-buoy*, as already shown, is *black;* and, with the two succeeding buoys, which are *red*, is to be left on the starboard side. Two other red buoys mark the west side of the channel; but the way in is to pass near to the three black buoys, upon the Western edge of the Westmark Knock, on the opposite side. On the starboard side, opposite to the second black buoy, is a *red* buoy, with *white head;* opposite to the third black buoy is a *white* buoy; and, at three-quarters of a mile above the last, on the same side, is another *white* buoy, near to which, in mid-channel, are 3 fathoms of water. Upon the sand to the westward of the latter are two beacons and a black buoy, which distinguish a swashway named *Crab's Hole*, now converted into a new Cut for Wisbeach.

BOSTON DEEPS *and thence to the* HUMBER.

THE CHANNEL to Boston Deeps is formed by the sands described on the Chart, which form also, the northern side of LYNN WELL. The principal of these sands is that called the *Long Sand;* connected to which, on the N.E., is another, called the *Dog's Head;* and without these, on the eastern side, lies that called *Lynn Knock*. On the latter is a *black buoy* with a vane. These, with the *Roger*, to the westward, form the south side of the channel. On the northern side lies *Skegness Middle*, the *Outer* and *Inner Knock*, and the *Wainfleet Sand*. Beside these, there is a middle ground, or shoal, called the *Sculrig*.

The *Long Sand* lies in a curve. The greater part of it is steep-to, particularly near the Hook, on the south side, the part nearest to the light-vessel. The *Dog's Head* is narrow, but it is four miles in length, and its shoaler parts are covered at one-quarter flood: its direction is N.E. and S.W.

The *Outer* and *Inner Knock*, which now constitute but one bank, lie nearly mid-way between the Dog's Head and the shore of Wainfleet, in a similar direction. The extent is now more than three miles. The channel between the two banks is three-quarters of a mile in breadth.

Skegness Middle is a hook or spit of sand, dry at low water, which forks from the shore of Skegness at about half a league from the Outer Knock. Several vessels, from the northward, have been lost, by incautiously entering between it and the shore. Near its eastern side, and parallel with it, is a hole of 2½ and 3 fathoms.

BOSTON BAR forms a crescent, rounding northward, which connects the Dog's Head with the Outer Knock. From the chequered buoy on the north end of the Docking, the bar bears West, a little southerly, 10 miles; and from the red beacon buoy, on the north end of Burnham Flats, it bears W.N.W. ½ W. 7¾ miles. On the middle of the bar the present depth is only 5 feet at low spring-ebbs, but near it, both without and within, are 5 fathoms.

The WAINFLEET SAND and FRISKNEY FLAT are those extensive grounds which border the shore between Wainfleet and the River Witham, or Boston River. Of these the northern half is three miles in breadth, and it inclines irregularly from high to low water mark; but the southern half has a gradual inclination from the one to the other. The whole is dry at low water, and on its edge are seven black buoys, as shown hereafter.

The *north end of Boston Bar*, or of the *Outer Knock*, is distinguished by a very large *black beacon buoy*, on the S.E. or outside of which are 12 feet at low water, and this is, consequently, the best depth for crossing the Bar. At half a mile S. by E. from the beacon buoy is a *red* buoy on the Bar, or *Dog's Head*, which lies in 7 feet, to be left, in passing, on the larboard side.

At half a mile from the red buoy is a *black* buoy, in 4½ fathoms, near to which you pass, leaving it on the starboard side. The course in, to this buoy, is S.W. ¼ S., and the fair-way course thence, between the Dog's Head and Knock, is S.W. by W. 3½ miles; the general depths 5 and 6 fathoms: thus leaving, on the larboard side, a *red* buoy near the Dog's Head; a *black* one near the middle of the Knock on the starboard side, and another *black* one on the Bar of Wainfleet Harbour, on the same side.

From the buoy last mentioned the edge of Wainfleet Sand trends nearly W.S.W. and W. by S., and is denoted by six *black* buoys, which mark the passage on the starboard side, while two *red* buoys on the middle ground, called the *Sculrig*, denote its larboard side. The general depths in the channel to the last black buoy, which is called the *High Horn Buoy*, are 5½, 6, 5½, and 5 fathoms. The bottom is of sand and clay.

In the inlet called *Clay-Hole*, at 2¼ miles W.S.W. ½ W. beyond High Horn Buoy, is good anchorage in 2½ fathoms; two *red* buoys on the larboard side lead to this anchorage. Here a pilot for Boston may be taken.

The *Mackarony* or *South Channel* has latterly become the best channel for the port of Boston. It lies between the bank called the *Hook Hill*, on the west, and the *Roger*, with others, on the east. A white buoy, on the Roger, marks the entrance. There are four black buoys on the Hook Hill, all to be left on the western or starboard side, and three red buoys on the opposite side. The depth here is 9 feet at low ebbs.

Boston South Channel is along the south side of the Roger. It has 4 and 5 fathoms of water, but is obstructed at each end by the general flat, on the west part of which only from 5 to 2 feet may be found.

As the BAR-RIDGE of BOSTON DEEPS, above described, stretches across, between the Dog's Head and Boston Knock, vessels bound in must wait for the tide, according to their draught. Here, it is to be remarked, that the Bar is a shifting one, and the direct course over it may soon vary, several points, from that which has been described. To this due attention should be paid. The buoys may be shifted, but the rule is still to be observed; that is, always to leave the two black buoys on the starboard, and the two red ones on the larboard side; next the two black buoys on the Knocks starboard, &c.

WAINFLEET ROAD and HARBOUR.—Those advancing from the northward, toward Gibraltar Point, or Wainfleet Harbour, must be very cautious, in coming along shore, not to approach so near as to get in between Skegness Middle and the Main. This may be avoided by not coming nearer than in 3½ fathoms.

When abreast the middle part of Skegness Middle, the northernmost Skegness House, which is readily known, bears W.N.W.; and, with the southernmost Skegness House bearing W.N.W., you will be clear of the southernmost part of the sand; and may then run along shore, at pleasure, in regular soundings, as far to the southward as Sykes' House, which is the southernmost house on that shore, and a very good mark for ships to bring up by, only observing to bring it to bear N.W., and let go your anchor in 3 or 3½ fathoms, at low-water, spring-ebbs. The bottom is here good holding ground, the anchor will never draw home, if kept clear, and a ship can always ride, let the wind be as it may.

If bound into Wainfleet Harbour, get under way at half-flood, if spring-tide, if not drawing more than 8 or 9 feet; or at the last quarter-flood, if neap-tide. In hauling round the point, you must pass as near to the buoy, which lies on it, as you can; lest the flood, which sets very strongly to the westward, should drive you on the Wainfleet Sand. When abreast the Point, or even before you have advanced to it, you will see two beacons standing on the shore, by the end of the sand-hills; bring these beacons into a line, and keep them so, until you are well shut in within the point, or abreast the upper beacon; then let go your anchor: after this, get your small anchor and tow-line on the shore, and haul close up to the steep.

The tide flows at the Point at six o'clock on the full and change, and rises 16 to 18 and 20 feet.

Should night come on, before you can gain a sight of the Skegness-houses, when approaching from the northward, you may, by keeping the vessel in 4, 4½, and 5, fathoms, be sure of passing in, between the Inner Knock and main. Having advanced to the entrance, you will have 5½, 6, and 7, fathoms, and shoaling again to 5, 4½, 3½, and 3, fathoms: if in the middle of the channel, the lead will stick very much; and thus you may always know when to bring up.

In the night, or thick foggy weather, ships in Lynn Well, that cannot ride with southerly, S.S.W., and S.W. winds, may proceed to this place, and ride with great safety.

If BOUND OUTWARD, to the southward, from LYNN, WISBEACH, or BOSTON, when the water is low, it is recommended to every master of a vessel drawing above 9 or 10 feet of water, to pass between the Docking-Sand and Inner Dowsing, keeping over toward the latter; because, without this precaution, when there is much swell on, and th tide low, in running out between the Docking and Dowsing, your ship may strike on the overfalls; as, if the weather be hazy, you cannot see the churches of Ingoldmell and Addlethorp to guide you clear of them. When running out, keep these churches well open to the northward; that is to say, the upper or northernmost church well open to the northward of the lower one; and you will thus pass out in the best of the water, and may then pursue your course according to circumstances.

GENERAL REMARKS ON LYNN AND BOSTON DEEPS, by *Mr. Holditch.*—

In passing to the southward, from off the Lincolnshire coast, with an ebb-tide, so soon as you open Boston North, you will have, in spring-tides, a strong set to the E.N.E., sometimes at the rate of four knots an hour, and the flood in the contrary direction. When you have advanced to the Dog's Head, you will have the tide from the S.W. by W.; and, as you advance toward the Hook of the Long-sand, you will find a W. by S. tide, often at the rate of 5 knots an hour, and the flood the contrary.

When you are near the Dowsing, or the Docking Sand, within them you will have, on the first of the flood, the tide from the N.E., and then from the E. by N.; and the first of the ebb from the S.W., and thence round to the W. by S. Without these sands the spring-tides never slacken; for, when you bring up there, you will find the first quarter-flood from the N.W., second quarter from the N.E.ward, the last half-flood and first quarter ebb from the East to the S.S.E., half-ebb to low water from S.W. to the W.N.W., and the strength of the tide continually the same, being about 2½ or 3 knots an hour.

On the east side of the Well, near the Woolpack and Sunk Rocks, the ebb runs from the W.S.W., and the flood the contrary; and, from the Sunk buoy to Lynn Roads, the ebb-tide runs from the S.W., and the flood from the N.E. Observe that, all over the Well, on spring-tides, the velocity is about 3½ knots an hour; and the water often flows 4 fathoms in height, so that you must be careful to notice what time of the tide you bring up in, that you may have sufficient depth to ride in.

BOSTON DEEPS TO THE HUMBER.—Between Boston Knock and the entrance of the Humber are several overfalls and flats, described hereafter. The direct course and distance from Boston Knock to that place, within the Inner Dowsing, are N.N.E. 9½ leagues; but the safest course, to avoid the overfalls, &c., will be N.E. by N. 5½ leagues, and thence N. by W. 4 leagues to the mouth of the river, making proper allowance for the tide, which sets as hereafter described.

When Grimsby church appears in a line with Clea church, bearing nearly N.W., you will be on the edge of the Sandhaile, and may, if going into the river, steer N.W. by N., in order to pass between a red buoy on the sand called the Bull, and the Spurn Point.

From the HUMBER (Southward) *to* BOSTON *and* LYNN DEEPS, *&c.*

In proceeding toward Lynn Well, from the Humber, care must be taken to avoid the *Sandhaile*, which is flat. When on the outer edge of the Sand, in 5 fathoms of water you will have Dimlington cliffs, or high land, open to the eastward of Kilnsey church, will lead you along it, in about 5 fathoms of water.

Nearly 3½ miles S.E. from the extremity of the Sandhaile lies *Saltfleet Overfall*, which has only 3½ fathoms on it at low water, spring tides.

Three miles to the southward of Saltfleet, and one mile from the shore, lies *Thedlethorpe Middle.* It has only 6 feet on it at low water. Without it, at the distance of about three miles, is an overfall, with only three fathoms.

Two and a half miles nearly E. by S. from Trusthorpe church lies *Trusthorpe Overfall*, which has only 14 feet at low spring ebb.

From one to two miles to the southward of Trusthorpe lie the *Clay-huts;* they are elevations of clay, with only 5 to 8 feet over them, lying nearly half a mile from the shore.

About 9½ miles E. by S. from Trusthorpe lies the northernmost end of the *Inner Dowsing*,

Dowsing, upon which lies the black buoy, with staff and vane, mentioned in page 56. This shoal extends 6 miles N.N.E. and S.S.W., and the least water on it is 7 feet at low water.

When bound to BOSTON DEEPS, from the Humber, keep along shore, in 5 or 6 fathoms, according as you have the wind and tide, until Addlethorpe church apparently comes within half a cable's length of Winthorpe church; you will then see Boston Knock Buoys, and should keep nearest to the black ones, if the tide be low, as there is the deepest water on the Knock side. You leave the two red buoys on the Dog's Head on the larboard side, and all the black ones on the starboard. You may bring up any where in Boston Deeps, but the best roadstead is above the Sculrig.

When bound to LYNN or WISBEACH, keep along shore, as above directed, until you are past Lynn Knock; and when you deepen your water to 9 or 10 fathoms, you may haul up to the S.W. or S.W. by S., according to wind and tide, until you have passed the light-vessel and the Hook of the Long-sand, and got Hunston light to bear S.E. by S.* You may then haul more to the W.S.W., until you get Hunston light to bear S.E. by E. ½ E. On that bearing you may run to the westward, until you get into 7 or 8 fathoms: and, if in the night, bring up; but, if in the day, you will come in sight of the buoys, already described, and may proceed as the soundings direct. See the description, pages 60, 61.

In WORKING up LYNN WELL, from Lynn Knock, on the east side, next to the Middle and Sunk, you will have sticky ground, until you are up to the red beacon-buoy on the west end of the Sunk; but, all the way along the west side of the Well, the bottom is of sand. When you have Hunston light from S. ½ W. to S. by E. ½ E., you should stand no farther from the eastern side than where you deepen into 20 fathoms of water; as you will have 18 fathoms near the Hook of the Long-sand, and may be on shore before you can haul in the lead. It is therefore best, particularly in the night, to stand over to the westward only until you get into the deep or middle channel; as, to the eastward, you may stand into 14 or 16 fathoms with safety.

When you have gotten the light of Hunston to bear S.E., you may stand to the westward or eastward into 8 or 9 fathoms, and have nearly three miles across from S.E. to N.W.

Those who intend to take Lynn Well *during the night* should run with Hunstanton light S.S.W. until Lynn Well light bears S.W. by W., then steer for the latter, and you will clear Lynn Knock at the full distance of three-quarters of a mile.

Pilots for Lynn, *Wisbeach*, and *Boston*, may respectively be found in Lynn West-Channel, Wisbeach Eye, and Clay-Hole.

In sailing up, you must always allow, very particularly, for the strength and direction of the wind, &c., as well as for the tide, whether ebb or flood; as, off Boston Knock Buoys, Lynn Knock, and the Hook of the Long-sand, the spring-tides of flood and ebb often run 5 miles an hour, and neaps 2½ miles. The perpendicular rise, with the former, is 4 fathoms; and, with the latter, 14 feet.

Tides.—Off Boston Buoys the tides of flood and ebb run about W.S.W. and E.N.E. Off Lynn Knock, about W. by S. and E. by N. Off the Hook of the Long Sand from W. by S. to West, on the flood; the contrary on the ebb.

When the Long-sand is first overflowed on the flood, the tide runs very strongly from the eastward directly over it; so that, in light winds, when you cannot clear it, it is best to bring up in time.

FOULNESS *to the* HUMBER; *with* Directions *for that* River.

The course from a fairway off Foulness, or from mid-channel between the north end of Hasborough-sand and Foulness, to the Humber, westward of the Dudgeon light-vessel, will be first N. by W. ¾ W. about 9 leagues, and thence N.N.W. ½ W. 10 leagues. Or, if to the eastward of the Dudgeon Shoal, N. ½ W. 9 leagues, and thence N.W. ½ N. nearly 11 leagues. Particular attention must, however, be paid to the set of the tides, especially when near the shoals.

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* The mark leading clear of Lynn Knock, on its eastern side, in about 7 fathoms, is, Hunstanton lighthouse on with Snettisham spire, S. by W. ½ W. Snettisham spire on the west end of Hunstanton Cliff, S. by W., leads to the westward of Lynn Knock, and very close to the Dog's Head or Boston Bar.

NEW SAND, &c.—Without the Humber, at the distance of 3¼ miles S.E. by E. ½ E. from the Spurn lighthouse, is a *black buoy* lying off the shoal called the New Sand, with Easington-mill on with Kilnsey north cliff, and the high land of Dimlington open of the cliff, bearing N. ½ W.

To the W.S.W. ½ W., about a mile and a half from the New Sand buoy, there is now a *chequered black and white buoy*, on a bank lately grown up, and which may be called the *Chequer Sand*. This buoy lies with the Spurn high-light bearing N.W. ¾ N. distant about 2½ miles; the low-light a sail's breadth open to the westward: Kilnsey church N. ¾ E.; and the New Sand buoy E.N.E. ½ E. There are from 3 to 5 fathoms of water over the shoal at a low spring-ebb.*

Besides the buoys, above-mentioned, a vessel fitted as a *floating light*, is moored in 9 fathoms of water, between 3 and 4 miles without the Spurn Point; the buoy of the New Sand bearing N.N.W. ¼ W. distant about three cables' length; Dimlington Cliff, N. ¾ W. 6 miles; Kilnsey church, N. by W. ½ W. 3¾ miles; and the Spurn lighthouse, N.W. by W. ¼ W. 3½ miles. In this vessel a light, upon the improved principle, is kept constantly exhibited in the night, and a red ball during the day. A gong is kept tolling during foggy weather.†

SPURN POINT and STONY BINKS.—Off the Spurn Point, on a flat extending three miles to the eastward, are several hard spots, uncovered at low tides, and called the *Binks*. These lie between the shore and the light-vessel, &c. off the New Sand, and they were buoyed with *black buoys*, as follows, by order of the Trinity House at Hull, in 1836, for the purpose of marking the channel between them and the floating light.

The *Outer Binks Buoy* (name in white letters) lies in 5 fathoms, with the light tower of the Spurn, bearing W. by N. rather more than three miles distant, and Easington church N. by W. ½ W.

The *Middle Binks Buoy*, with a *staff and ball*, lies in 5 fathoms, at a mile and three-quarters W.S.W. ½ W. from the outer buoy, with the Spurn high light N.W. ½ W., Kilnsea south cliff N. by E., the high land of Dimlington North, and the chequered buoy above-mentioned, S. ½ W.

The *Inner Binks Buoy* lies in 5½ fathoms, one mile W.N.W. ¾ W. from the Middle or beacon-buoy, with the Spurn high light bearing N.N.W. one mile, and Kilnsea south cliff, N.N.E. ¾ E.

BULL SAND FLOATING LIGHT.—By order of the corporation of Trinity House, Hull, in 1832, a light vessel was placed near the S.E. end of the *Bull Sand*, which displays one brilliant light. This vessel is moored in 4½ fathoms, at about one mile and a half from the Spurn Point, and a quarter of a mile from the extremity of the Bull Sand, with the Spurn high light bearing N.E. ½ E. By day the vessel displays a blue flag, and a gong is sounded in dark and hazy weather. By steering directly toward this vessel, on a course N.W. ½ W., you leave the buoy, chequered black and white, on the starboard hand.

Buoy on the Bull Sand.—A *red* buoy, on the eastern edge of the Bull Sand, lies in about 3 fathoms, at a mile and a quarter N.N.W. from the Light-vessel, with the Spurn low light on with the S.E. end of the boat shed on the Spurn, bearing E. ½ S.; Clea Mill,

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* In the night a red coloured light shows itself from the high lighthouse, between the bearings of N.W. by W. and N.N.W. ½ W., a sector comprehending the new shoal, or *Chequer Sand*, westward of the floating light. On the last bearing the red light disappears, and the bright light is again in sight.

† The following Notice, dated *Trinity-House*, *London*, was issued on the 3d of November, 1829: "It having been represented to this corporation that masters of vessels and others, navigating in the vicinity of the Spurn Point, do not use sufficient caution, in crossing the Humber, to give the floating light-vessel a good berth, and to keep on the outside of her; in consequence of which want of care and attention, two vessels have recently run foul of the said light-vessel; masters of vessels and others are hereby cautioned to be more attentive to give the said light-vessel a good berth in crossing the Humber, and they are hereby apprised, that, after this cautionary Notice, the Penalties imposed by the Act 6 Geo. IV. c. 125, will be levied on the owner or master of any ship or vessel which shall run foul of the said floating light."

W.N.W. ½ W.; Grimsby church, W.N.W.; and Patrington church, N. ¼ E. The *Bull Sand* is nearly a mile and three-quarters long, and has, on its shoalest part, 9 feet of water.

THE CHANNEL-WAY, at the mouth of the Humber, is 3 miles in breadth, and shoalens gradually inward. In making the entrance, with the lights on the Spurn Point, N.W. ½ N. they *may* be thus kept until the light-vessel bears E.N.E., when you will be a mile to the southward of the chequered buoy: but be careful not to bring her more easterly, until the high light be open to the left or westward of the low light, when you should haul to the northward until the light-vessel bears East; the last bearing is to be kept on until the high light bears N.N.E., whence you may steer North, up the Humber, and haul into the Hawke Road.

Vessels from the northward, bound into the Humber, should, in rounding the light-vessel, give her a fair berth to the northward, and so as to avoid the *New Sand Ridge*, extending a mile out to the eastward: in hauling to the westward, be careful not to bring the light-vessel more easterly than E.N.E., whence you may proceed north-westward, as above directed.

Beacon on Donna Nook.—The Corporation of Trinity House, at Hull, have caused a beacon to be erected upon the low sandy point of the Lincoln-shore, called *Donna Nook*, on the south side of the entrance into the Humber, as a distinguishing mark for the guidance of vessels entering the river from the southward. The beacon is fifty feet high, painted *red*, of a conical form, with a cap at the top, and may be seen, in clear weather, from a distance of 3 or 4 leagues. The outer edge of the Sandhaile, having 3½ fathoms over it, is four miles east from the beacon.

Beacon on Clea Common.—Notice was given by the Corporation of Trinity-House, Hull, August 13, 1834, that a new beacon had been erected on Clea Common, for the use of vessels entering the Humber. The beacon is 60 feet high, of an octagonal form, and painted black. A vessel will clear the Inner Binks, &c., by keeping Grimsby church on with this beacon and bearing N.W. by W. ½ W.

The HUMBER LIGHTHOUSES.—On the Lincolnshire Coast, at about 12½ miles above the Spurn Point, the Corporation of Trinity House, Hull, have erected two lighthouses; these stand on the bank of the River, at South Killingholme; and, at 3½ miles higher up, on the opposite side, is another; all of which have exhibited brilliant fixed lights, from the 13th day of December, 1836.

The lights at Killingholme are designated as the High light and the Low light; the former is about 50 feet and the latter about 35 feet high. The light at Paull about 30 feet.

When the two lights at Killingholme are in one, they will bear N.W. ¼ N., and will lead ships and vessels, coming from sea, in a clear course up the river from the Spurn. On approaching them the light at Paull will be seen, when ships must alter their course to the northward, but not steer for it until the high light at Killingholme bears W.S.W.; at the same time strict attention must be paid to the state of the tide. Vessels bound up to the port of Hull, must be guided by the lead round Skitter Sand, the Sand buoy (*black*) bearing West from Paull lighthouse.

In case of need, with Killingholme lights in one, a vessel may take the ground with safety, the bottom being mud.

Great attention must be paid to the setting of the tides, as the ebb runs strongly over the Stony Binks, near the Spurn Point, from the southward, and the flood equally so in a contrary direction; therefore more *strict* attention must be given to the bearings than to the course steered; as all depends on the rate the ship is going. Spring-tides run at the rate of about 4½ knots; neaps 2 knots; but the ebbs in the freshes run with more rapidity.

A black buoy, on the point of *Cleaness-sand,* lies 2 miles E.N.E. of Cleaness, and 3½ miles N.W. by W. from the Spurn lighthouse. In mid-channel between, at the lowest ebbs, are 7 and 8 fathoms.

The MIDDLE is so called from its lying nearly in mid-channel, without Cleaness-sand. It has two white buoys upon it, and on its central part the depth at low ebbs is only 11 feet. The length of the shoal, which is narrow, is 2½ miles, from N.W. ½ W. to S.E. ½ E. From the south buoy the Spurn high light bears nearly S.E. 3 miles, and Cleaness buoy S.W. by W. ¼ W. one mile. Depths between the two latter, 3 and 4 fathoms.

IN RUNNING INTO THE HUMBER, you must not borrow upon the Sand-haile, unless the wind be in the S.W. quarter; for it is to be observed that, the N.E. part of the sand lies off so far from the shore, that it could not be weathered by vessels running along it in 5 or 4 fathoms, with a S.E. wind.

Having passed the Spurn, with a southerly or S.W. wind, and intending to anchor, the best place will be in *Grimsby Road*, which is 5 miles to the N.W. ½ W. from the Spurn Point. In proceeding to this Road you pass the floating light and buoy, the Bull, and the buoy of Cleaness-sand on the larboard side, and the buoy of the Middle on the starboard. You run N.W. by W. until Grimsby church tower bears W. by S. and a black buoy on the S.E. end of the sand called the *Burcum*, E. by N. half a mile.*

Through the Channel between the N.W. end of the Bull and the edge of Cleaness-sand the flood-tide sets strongly to the northward, and the ebb to the southward.

In Grimsby Road large ships lie at a little without the stream of the Burcum buoy, in 5 or 6 fathoms. Small ships lie within the buoy, and a very little below it, in 9, 10, 11, or 12, feet at low water. It is requisite to observe the time of the tide at which you anchor, and whether spring or neap; as, with spring tides, the water rises here from 20 to 30 feet; and, with neap tides, from 12 to 15 feet.†

HAWKE.—With N.E. and easterly winds, the best roadstead in the Humber is in the *Hawke*, with the Spurn Point bearing S. by E. ½ E. one mile and a half, in 5 or 6 fathoms at low water.

To Run up to Sunk Island, from the Hawke, steer about N.W., edging off and on Trinity sand, on the N.E. in 6 and 7 fathoms, and you thus leave the Middle Sand, with its buoys, on the larboard hand. The lights bearing S.E. ½ S. lead clear of the latter, and you may proceed with them thus until within a mile of Sunk Island. Here you may anchor on good ground, in 6 or 7 fathoms, with Humberstone church on with Clea mill, bearing S. by W.

The coast of Sunk Island is bordered with sand to the distance of one-quarter to half a mile. Of this sand the spit or outer part is distinguished by a *white buoy*, lying with Patrington steeple E.N.E. and Grimsby church tower S.S.W. At a short distance without this buoy the depth is 6 and 7 fathoms.

At half a league above the Sunk Spit there is good anchorage with Sunk Chapel and Patrington steeple in a line, bearing E. ¾ N.

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* *The buoy on the S.E. end of the Burcum* lies two miles N.W. by W. from that off Cleaness, one mile W. ½ S. from the north buoy of the Middle, and 5½ miles N.W. ½ W. from the Spurn Point. Its thwart-mark is, Grimsby church W.S.W. ½ W. The sand extends from the buoy about 3½ miles to the N.W. and is a quarter of a mile broad. Between the buoy of this sand and that of Cleaness are 5, 4, and 3, fathoms at low water; and between the latter and the Spurn Point are 5, 7, 8, and 7, fathoms. Between the Burcum and western shore are 5, 6, and 7, feet at low water, all the way through to Stallingboro' Creek.

† PORT of GRIMSBY.—This port, the entrance of which lies N.W. by W. 6½ miles from the Spurn Point, was, in former times, ranked among the first in the North of England; but, from long neglect, it became gradually choked up and lost its importance; at length the incorporation of the '*Grimsby Haven Company*' has been the mean of restoring it, and improving its former condition. A plentiful supply of back water has been taken advantage of, and a wet dock constructed, with floodgates and sluices, and commodious buildings for warehousing, &c. The lock within the Haven is about 150 feet in length. It is rather more than a quarter of a mile distant from the shore of the Humber, and has a depth of 12 feet at the lowest neap-tides; but with ordinary springs the depth is 20 feet, and with high springs 23 feet. A depth of 18 feet of water is penned up in a part of the lock, and 14 feet at the extremities by the sides of the town. The whole excavation being about 18 acres, and affording ample room for 250 ships to load and discharge, besides a sufficient space for passing and repassing. In addition to the wet dock is a dry one, besides a building yard of considerable extent. There are, also, various private docks, which have been excavated for the purpose of bonding timber afloat, besides yards and sheds of various descriptions.

The goods usually bonded here are all kinds of wood, mahogany, and staves; brimstone, cork, iron in bars, hemp undressed, tow, tar, pitch, rosin, turpentine, tallow, kelp, spermaceti, oil, head-matter, trail-oil, and all other fish oils: blubber and whale fins of British fishing; Indian deer-skins, half dressed or shaved, and other skins and furs not tanned or in any way dressed, hides, &c.

It has been remarked that Grimsby holds out peculiar advantages for merchant ships; for, while the cost of bonding and transferring goods is not greater than at Hull, a considerable river navigation and two-thirds of the expense of pilotage are saved. Corporation dues are not demanded, and the charge for wharfage, by act of parliament, is not allowed to exceed one half of that taken in the port of London. Should a vessel arrive during neap-tides, she may find safe anchorage till the following springs in Grimsby Roads.

On leaving Grimsby Road, for proceeding toward Hull, you leave the Burcum buoy on the larboard side, and thence follow the direction of that sand, with Killingholme church N.W. ½ W. open to the eastward or right of the malt-kiln, or large red house, at the mouth of Stallingboro' Creek. This will lead within sight of the white buoy of the Sunk Spit. In the mid-channel you will have 8, 9, and 10 fathoms.

If the wind be scant in the S.W. quarter, you may keep toward the Burcum in 5 or 6 fathoms; but higher up do not approach it nearer than in 7 fathoms. On approaching Stallingboro' Flat, which is steep, and extends to three-quarters of a mile from shore, steer for the white buoy of the *Holm Sand,* next described, until Imingham church bears W. ½ N.; this will be about half a mile to the southward of the buoy.

The HOLM SAND is a long spit extending from the Cliffy Point near Paull-town 4½ miles South, where it terminates in the middle of the river. The white buoy above-mentioned, lies on its outer edge, in 4 fathoms, with Imingham church W. ½ S. and Patrington steeple E. ¼ S.

At about two-thirds of a mile S.E. ½ E. from the white buoy, is a buoy painted *red and white,* on the extremity of the *Holm Ridge.* This buoy lies in 3½ fathoms, with Ottringham church a little more than a ship's length to the eastward of Stone Creek House, bearing N.E. by E.; Stallingboro' House S.W. ½ S.; Paull church N. ½ W.; and the Holm Buoy a ship's length open to the northward of Roxham wood, bearing N.W. ½ W.

In the bight to the eastward the water is shoal, there being only 3 and 2 fathoms. On the western side the tide sets strongly upon the sand; and here, in mid-channel, are 9 and 10 fathoms of water.

Should you be caught in the bight with a flood-tide, you must immediately come to an anchor: and, in a scant wind, if you cannot drive to the southward, let go an anchor promptly.

From abreast of the Holm Buoy with Killingholme lighthouses in a line, you steer nearly N.W. until you have brought Grimsby church in a line with Stallingboro' kiln; and then, with the mark on, or rather with Grimsby church a handspike's length open to the eastward of the kiln, upon a N. by W. course, you reach *White Booth Road,* and may there anchor in 6 fathoms, with Grimsby church a sail's breadth open to the eastward of Stallingboro' kiln; Killingholme church W.S.W.; Paull-town open to the northward of Paull Cliff, N. by E. ½ E., and Patrington church E.S.E.

From Whitebooth Roads you proceed in the direction of N. by E. ½ E. toward the lighthouse at Paull, which has been described in page 67. Or, in advancing upward you steer, for a short distance, N. by E. toward Paull-town, with the town on the north end of the cliff; and then with Marfleet church on with the jetty, N. ¾ E. three miles. Paull Road lies close in-shore; but the hardness of the ground, and the rapidity of the tide, make it the worst road in the Humber. Those unacquainted with the navigation of this place should have a pilot from Grimsby Road; for the tides are so exceedingly rapid, that, were a ship to touch upon the sand, on either side of the channel, she would probably upset immediately upon taking the ground.

The Skitter Sand is that extensive bank on the South and West sides of the river, which extends upward to beyond the western part of Hull, and southward to White Booth Road. In the bend of the river it extends nearly two-thirds over, and half-way over opposite to Hull. A great portion of the upper part is dry at low water; and on the lower part the depths are 2 and 3 fathoms: within it is a swash along shore.

The edge of the Skitter is distinguished by five buoys; the first three are *black,* and lie at about a mile and a quarter from each other; the first bearing West from Paull lighthouse: the fourth and fifth are alike, *black and white,* opposite to the citadel and town of Hull, as shown in the chart of the river. On the opposite side, upon the shoals called the *Hebbles,* is a white buoy: the latter is nearly a mile W.N.W. ½ W. above Marfleet Jetty, and a mile and three-quarters below the entrance of the docks on the west of Hull, which bears from it W.N.W. ½ W.

The proper place for anchoring in Hull Road is, abreast of the citadel, or a little below it, in 5 or 6 fathoms of water. If you intend going into the harbour or the docks, you should, if the tide be then flowing, run on shore at the Dolphin Point, and get ready for warping in.

SPURN POINT *to* SCARBOROUGH.

In Sailing out from the Humber, for the northward, it will be requisite to attend to the directions given for entering the river. The lights and buoys will be a sufficient direction for clearing the New Sand, &c. Having then passed the Spurn Point, the Stone Bank, and New Sand, until you open Dimlington high-land without the land to the southward of it, you may steer N. ½ E. for Flamborough Head, the distance to which will be 11 leagues. If you come out of the Humber in the night-time, so soon as you have passed the western part of the Stone Bank, &c., steer along to the eastward, until you find the water deepens to 10 and 12 fathoms. Here you will be without the buoy of the New Sand, and may proceed on a direct course for Flamborough Head. The ground without the head is foul, to the distance of two cables' length.*

BRIDLINGTON BAY, &c.—Within Flamborough Head, on the south side, is the bay called Bridlington or Burlington Bay, in which lies the sand named the *Smithick.* The N.E. end of this shoal lies one mile S.W. by S. from Flamborough Head, and it extends thence to the W.S.W., increasing in breadth. On the N.E. part of the shoal there are only 2 fathoms at low water; but, to the southward, there are 3 and 4 fathoms. It is more fully described hereafter.

In the month of June, 1837, the corporation of Trinity-House, London, caused a *red* buoy to be placed off the N.E. end of the Smithick, in 4½ fathoms, with the following marks:—the southernmost windmill on Bridlington cliff in line with a white house, bearing W.N.W. ½ W.; Bridlington church N.W. by W. ¾ W.; Flamborough windmill, N.W. by N.; and Flamborough light tower N.N.E. ¾ E.

There is very good riding within the Smithick, in any part of Burlington Bay; but the best place is with the Quay Street open, bearing W.N.W., in 5 fathoms at low water.

BRIDLINGTON HARBOUR.—"To nautical men, who navigate the eastern coast of England, it is well known that there is not a harbour more conveniently situated between Leith and Yarmouth, where vessels can take refuge in storms, from the northward and eastward, with greater safety, than in that of Bridlington; neither is there any other on the coast, where an improvement is more necessary for the succour of ships employed in the northern and eastern trade, especially since the establishment of the light on Flamborough Head has caused an increased resort of ships to Bridlington Bay, to the number occasionally, in contrary winds, of upwards of *three hundred.* These ships are frequently compelled, by the violence of the eastern gales in the winter season, to cut from their anchors, which they often lose; then proceeding to sea, and being on a lee-shore, are sometimes stranded or wrecked.

"Ships going southward heavily laden, and labouring on this side of the Humber, would find an easy retreat in Bridlington Harbour, IF ENLARGED; as, at spring-tides, it would afford 20, and at neap-tides, 14, feet of water; and the distressed mariner would not only obtain security for his leaky, dismasted, half-wrecked, vessel, but also refreshment for his passengers, reparation of his damages, and necessaries for the prosecution of his voyage.

"*The advantage of a spacious Harbour,* having a wider entrance, with a light fixed upon the pier by night, and a flag by day, to mark a sufficient depth of water, would encourage the stranger to approach with confidence, as there are no rocks or shifting sands to obstruct the passage, when it might be impracticable for a pilot to get on board.

"The small number of vessels, which, in its present state, can take shelter therein, are not only crowded together in extreme confusion, but the heavy seas, rushing in at its entrance, cause a violent agitation, and frequently much damage; the light-vessels being pressed down by the larger ones, when the tide recedes: and it is no exaggeration to say, that it will not "admit one-fifth part of the vessels which would take refuge therein in eastern gales, provided there was room to contain them."

These considerations produced a general meeting of the principal Ship-Owners, Merchants, Master-Mariners, and other Inhabitants, of the port and neighbourhood of Bridlington, on the 8th day of November, 1808, when the following resolutions were unanimously passed:

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* The antient land-mark of the coast of Holderness, Owthorne church old spire, better known by the name of the Sister-Churches, was undermined by the sea, and fell to the ground, with a tremendous crash, February, 1816.

1. That Lord Viscount Galway be requested to take the chair.

2. That this meeting has, for many years, observed with deep concern the considerable losses sustained by the shipping interest employed on this part of the coast, from want of a more commodious harbour at this place.

3. That, though the harbours of Scarborough and Whitby have been considerably extended and improved, yet this harbour retains its original magnitude, which (however adequate at the remote period of its formation) is now, from the increase of the number and size of shipping, evidently insufficient to admit one-fifth part of the vessels, which would take refuge therein in eastern gales, provided there was room to contain them.

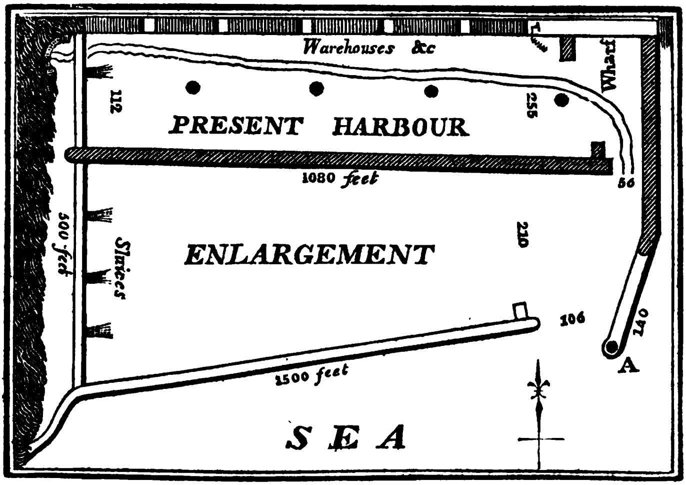
4. That it would materially conduce to the preservation of many lives, and much property, if this harbour were improved, agreeably to the sketch subjoined, or in some other manner to be suggested by a civil engineer.

5. That, in order to give full effect to these proceedings, it will be necessary previously to obtain the approbation of those who are interested in the trade, which (it is trusted) will ensure the sanction and co-operation of the existing commissioners of Bridlington-Piers.

6. That the Collector of the customs at Bridlington be requested speedily to adopt proper measures, with the view of obtaining that approbation.

(Signed) ARUNDELL GALWAY, Chairman.

For more than twenty years from the date above mentioned, this important matter appeared to lie nearly dormant; but we have continued the plan subjoined, from edition to edition of the present work, and have at length the gratification of finding that it, or more probably an improvement on it, will be realized.



Plan of the Harbour, as proposed in 1808.—A, Lighthouse intended.

The Trustees of the Harbour have, since December, 1828, caused to be exhibited upon a staff, 100 feet within the south end of the east pier, a red flag by day, and a light by night. The flag or the lights are hoisted when there is a depth of 7 feet, with flood-tide, at the entrance between the piers, and remain until the tide has ebbed to the same.

[Bridlington New Harbour.—The act 1st of Victoria, c. cx. is an 'Act for improving the Piers and Harbour of Bridlington, and for rendering the same more safe and commodious as a Harbour of Refuge.'

By this act several recited acts are conditionally repealed, but the property of commissioner

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under former acts is vested in commissioners under the new act, and officers appointed under former acts are to be continued unless removed by commissioners, &c.

§ viii. to xliv. relate to the appointment, qualification, and duty of commissioners, &c.

By § xlvii., the commissioners may levy a duty of one farthing for every 2½ tons of coals, conveyed in any vessel past the port of Bridlington, for the purpose of being delivered to the southward of the respective ports at which they shall be shipped; but this duty is to cease at the termination of 31 years, from the time of passing the act, 12th July, 1837.

Other duties, although comparatively trifling, are to be exacted from vessels laden or unladen at the Harbour, on corn, coals, coke, and numerous other articles named in the act, including timber, cordage, lime, bricks and tiles, slates, tea, sugar, coffee, stone, &c.: but it is provided that vessels entering the harbour, merely for protection or refuge, whether outward or homeward bound, in ballast, shall not pay more tonnage duty after the aforesaid duty of one farthing for every 2½ tons of coals shall have been paid.

In other cases a duty is imposed on the burthen of *every vessel entering the port*, of six-pence per ton. For every vessel *lying within the harbour*, and not belonging to Bridlington, weekly, per ton, one half-penny: for every other vessel having three masts, and being the property of any person residing in the parish of Bridlington, for each time such vessel shall enter the port, 5*s*. Having two masts, 4*s*. 4*d*. Having one mast, 3*s*. 4*d*. To be paid by the Masters, on their owners' account.

Any master departing, or attempting to depart, from the harbour without paying the duties, is liable to a penalty of £20, over and above the amount of duties. § 64.

Former duties, under a grant of Queen Elizabeth, are continued for vessels laden or unladen in the harbour: and

Double duties are to be paid in respect of foreign vessels: but, by an order in council, or of the Lords of the Treasury, the duties on such vessels may be reduced to the duties payable by British vessels; and the Treasury may, from time to time, reduce in *an equal degree* the duties granted by the act, and again raise the same to the rates originally granted.

The Harbour-master, or his deputy, is to regulate all the vessels in the harbour; and he may cut or destroy mooring ropes or chains improperly or inconveniently placed. Penalty for not obeying his orders, not exceeding £5, exclusive of contingent expenses.

For other particulars the reader is referred to the act, which contains, in 48 pages, no less than 123 sections.

FLAMBOROUGH HEAD.—*The Lighthouse on Flamborough Head* is erected at about 400 yards within its extreme point, close to a bluff on the south side of Silex Bay, which is the only place near the Head where a boat can land, and people ascend the cliff.

The light is *revolving*, and is triangular, with *three faces*, of seven reflectors each; and, in order to distinguish it from the revolving lights of *Tinmouth* and *Cromer*, which show a face every minute, it will exhibit a face every *two minutes*. One of the faces is coloured *red*, and the lights from that face being diminished, will not, in hazy weather, or at great distances, be visible, so far or so strongly as the other two faces; and when, in such cases, only two faces are seen, the interval of time between them will be *two* minutes and *four* minutes *alternately*, which will sufficiently distinguish this light from any other.

The SMITHICK shoal may be said to extend within the limits represented by the dotted lines in the Chart, encompassing every shoal which has less depth of water upon it than 3½ fathoms; the shoalest parts of the Smithick are rocky ground, and are (as represented by the pilots and fishermen) dispersed over various parts of this shoal, but have not less than 2 fathoms upon any of them: the north part of the shoal is narrow, but the south part is a broad extended flat; for, in taking a range of soundings toward Sewerby (bearing North), there was found a breadth of nearly one league, with not more than 4½ fathoms, nor less than 3½ fathoms, reduced to low water: but the pilot's leading-mark for running out of *Bridlington Bay*, clear of the south end, is one mile to the southward of this, having Bridlington church on with some houses near the west end of the South Pier of Bridlington Quay.

In going into Bridlington Bay, between Flamborough Head and the Smithick, keep Sewerby Hall just open without the Bluff, near South Sea, (a break or cove lying to the southward of Flamborough, until the light bears N.N.E., when you will be abreast of the north end of the shoal, and may steer toward Bridlington Quay, for anchorage in the bay.

Gray's Farm, to the westward of the old tower, upon the head, or the lighthouse bearing North, will lead clear to the eastward of the Smithick.

From FLAMBOROUGH HEAD *to* SCARBOROUGH the course is N.N.W. ¼ W. distance 5 leagues. SCARBOROUGH is a pier-harbour, and the vessels lie aground in it at low water. The best times for going into this place are, at half-flood, or after the first quarter ebb, at which times the ships may be run aground: the bottom is clean sand. Should the wind, by being northerly at the time of your going in, render it necessary for you to stand over toward the Spa-house, you must be careful to avoid the rocks, which lie at a considerable distance from the shore, to the southward of the Spa: they dry at low water. The swell, which comes round the pier-head, when northerly or easterly winds blow strongly, causes the ships in the harbour to range very much when they are afloat. At such times it is necessary to moor them with their cables to the dolphins or piers. Scarborough has a good outlet for ships bound to the southward, but bad for those bound to the northward. You may anchor in Scarborough Wick, in 5 or 6 fathoms of water; but it is not safe to continue there long, of which there have been some fatal instances.

A *tide light*, upon a white tower on Vincent's Pier-head, is to be left on the starboard side when entering the harbour. It exhibits a red light, and which may be seen at 10 miles off. Its height is 41 feet above the level of high water, and the light is kept on while there are 12 feet of water in the harbour. By day a *blue* flag is hoisted for the same period.

Information has been given to the public, that the harbour of Scarborough is now so far improved as to afford shelter, in all gales of wind upon the coast, to vessels capable of bearing the ground. In gales from the N.E. quarter, vessels will be safe, if they run behind the West Pier, by not making for the port too early in the tide, which is too frequently done: and, in gales from the E.S.E., if they find the old harbour too crowded, they may enter safely into the new harbour made by the continuation and completion of the outer pier, in which there are now placed dolphins and mooring-rings. Close-to, and immediately within shelter of the *Adker*, there are 15 feet in high water, neap-tides, and 18 feet in spring-tides. In the entrance of the outer harbour, there is nearly, but not quite, so much. The course into both harbours is to the eastward of north.

TIDES *between* FOULNESS *and* SCARBOROUGH.

The Tides at and near the Leman and Ower have been explained in pages 54 and 55.

At the Dudgeon Light, spring-tides flow at 6 o'clock, but the stream continues to run until half-past 7; the flood runs south, and the ebb north. Ten miles N.N.W. from this shoal, the flood sets S.S.W., and the ebb to the contrary.

On the north side of the Outer Dowsing, the tide sets variously. The first quarter flood S.W. by W.; at half-flood S.E. by S.; and, near the latter part of the flood, E.N.E.

Between Foulness and Blakeney, it flows, on shore, at 6 o'clock; spring-tides, at Blakeney, commonly rise 20, and neaps about 13, feet. Here the tide without runs to the southward for three hours after high water on shore; which must be particularly attended to. With strong northerly winds, the water sometimes rises 4 fathoms on the bar. If bound in, with the wind at W.N.W., allowance must be made, that the flood may not send you to leeward.

In Wells Road the flood-tide sets W. by N. ½ N.; and it runs, on the full and change, until 4 o'clock. Four miles farther from shore, it sets W. ½ N., and runs until half-past 4. In Wells Harbour the vertical rise is from 16 to 18 feet.

Between Blakeney and Lynn, generally, the flood sets along shore to the westward. Between Stukey Overfalls and the north end of Docking Sand, the flood sets about W.S.W., and the ebb E.N.E.

Between the north end of Docking Sand and the south end of the Inner Dowsing, and also without the north end of the latter, the flood sets S.W. by W. ½ W., and runs until half-past 5 o'clock. On the West side of Docking Sand, the flood runs about W.S.W., and, in Lynn Well, S.W. by W. In the Well it is high water at a quarter past 6; and spring-tides rise 23 feet; neaps about 14 feet. In Boston Deeps it flows at 6 o'clock. Near the S.E. end of the Docking it flows at 6 o'clock; springs rise 20, and neaps 13 feet.

Within the Inner Dowsing, the tide flows at half-past 5; springs rise 18, and neaps about 10, feet. Here the flood sets about S.S.W.

Humber.—At the Spurn Point, on the full and change, it flows at a quarter past 5; on the Sandhaile at 6; but in the offing, at the distance of 7 or 8 miles, it continues to run until half-past 7 o'clock.

The flood sets across the mouth of the Humber, and strongly upon the N.E. part of the Sandhaile, three quarters of an hour before it bends in: after which it sets W.S.W. toward the Lincolnshire coast. Within the river, the stream of flood veers about to the northward of west; and, with the Spurn lights N.E., it runs from N.W. to N. by W. into the Hawke, and North directly on Trinity Sand.

The ebb comes down into the Hawke a considerable time before high water on shore.

In the channel, between the west end of the Bull and Cleaness-sand, the flood sets strongly to the northward, and the ebb to the southward. In Grimsby Road, the water rises with spring-tides, from 20 to 30 feet, according to the wind: and with neaps, from 12 to 15 feet. At Hull, it flows at 6 o'clock, and spring-tides generally rise 20 feet. In this part of the river, they run with such strength, that, should a ship get aground on the Holm, or on Skitter Sand, she would, as before noticed, be in great danger of immediately oversetting.

In Bridlington or Burlington Bay, the tide flows at half-past 4; springs rise 13, and neaps about 8, feet. The flood-tide sets nearly along the shore to the southward; and, in the offing, continues to run for three hours after high water on shore, or until it is half-ebb there. At Flamborough Head it flows at 6; spring-tides rise 20, and neaps about 11, feet. Near the Head, on the south side, the flood-tide sets S.W. by W., and the ebb N.E. by E.; therefore, ships bound to the southward, with a scant wind off the land, should not pass the Head until they have a flood-tide in their favour. At Scarborough it flows at a quarter-past 4; spring-tides rise 13, and neaps about 8, feet.

SECTION VII.

SCARBOROUGH *to* ST. ABB'S HEAD; *including the* FARN ISLANDS, HOLY ISLAND, &c.

ROBIN HOOD'S BAY.—Nearly 8 miles N. by W. from Scarborough, is the south cheek of Robin Hood's Bay; a bay, under the north side or cheek of which vessels may stop a tide, in 8 or 9 fathoms; but it will not be prudent to stay longer, especially in winter.

WHITBY.—THE HARBOUR OF WHITBY lies nearly 7 miles to the N.N.W. of the south cheek of Robin Hood's Bay; it is a pier-harbour, and ebbs almost dry at low water. Without the entrance, on the eastern side, is a dangerous ledge, called *Whitby Scarf*, which extends three-quarters of a mile from the shore to the northward; but there is a passage within, named the *Sledway*. The ledge is composed of hard black rock, with large stones lying down to low water mark. It is quite clear without: and the Head bears from the west pier N.E. by N. ½ E. nearly one mile. The rock is rendered more particularly dangerous, by the flood tide's setting across the Harbour's mouth to the southward.* The sledway, between the rocks to the north and south, is 300 yards in breadth.

WHITBY

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* This, and the subsequent description, is from the excellent survey of Whitby and the adjacent coast, by Mr. J. Pickernell; published by Mr. Laurie.

WHITBY, situated on the mouth of the Esk, is celebrated chiefly for manufacturing canvas, and for the extensive alum-works in its neighbourhood. Its harbour is the best on this coast, and has a fine pier; but it has no river communication with the interior country. Behind the pier is a battery, which mounts twelve eighteen-pounders. This town was formerly noted for its abbey, of which some ruins, still remaining, testify its antient magnificence.

Here

Whitby Lighthouse.—A stone lighthouse, on the western pier-head, exhibits a brilliant fixed light, at 83 feet above the sea, which is kept in two hours before and after high water. The height of the tower, from the base to the lantern, is 60 feet, and the light may be seen four leagues off. In the day a flag is hoisted on the western cliff, during the same period of tide, or while there are, upon the bar, 8 feet of water.

The tower of Whitby church, formerly useful as a mark, fell down in the month of June, 1830.

N.W. by W. two miles from the head of Whitby Scarf, is the cove or road of *Sandsend*, where vessels may safely lie, with southerly winds, in from 8 and 7 to 4 fathoms, at low water. But nearly half way between is a large rock, called the *Upgang Rock*, which has only 4 and 5 feet over it, at low water. This rock stretches from the shore, with its outer part bearing N.N.W. nearly one mile and a quarter from the west pier. Between are 5, 4, and 3, fathoms, at low water.

In coming in for Whitby, from the southward, the mark for avoiding Whitby Scarf is, the north cheek of Robin Hood's Bay S. by E. ½ E. open of High Whitby, which lies 3 miles to the northward, until a remarkable house in the country, called Larp-hill-house, appears in a line with the east pier-end of Whitby, bearing S.S.W. ¾ W.

The road lies between Whitby-rock and the Upgang-rock, and has from 5 to 3 fathoms at low water. The mark for it is, Larphill-house, over the middle of the town, bearing S.S.W. The mark of Sandsend road, to the westward, is, the middle of Sandsend Town and Mulgrave-castle in a line, bearing W. by S. ½ S.

When boats cannot venture off, if a flag is hoisted upon the cliff, you may safely run for the harbour, but if, instead of the flag, a fire appears in its place, attempting to go in would be extremely hazardous.

Those who come from the southward should strictly observe that, at spring-tides, when the wind blows hard from any point between S.S.E. and East, vessels drawing 10 feet of water may pass through the Sledway, if the signal is hoisted to show that there is water on the bar; but those drawing more than 10 feet must haul round the north part of the rock. In losing the tide of flood, so soon as you come within the rock, haul up until the Burgess, or second pier-head, on the east side, is brought nearly a sail's breadth open of the east pier-end; then stand in for the harbour. It is also to be observed, that there have been many instances of vessels not fetching in, merely by giving the rock too great a berth; this occasioned their hauling up so much as to come parallel with the surge; which, by checking their headway, caused them to fall to leeward, and go on shore.

The mark for sailing through the Sledway is, the second nab, on the west side of the harbour, open of the west pier-head.

The tides are noticed hereafter. At high sea, the water appears all broken between the rock and main; and, when this occurs with easterly winds, there is but little tide setting to the southward.

Nearly two leagues N.W. by N. from Whitby is *Runswick Bay*, a good retreat for vessels in gales of wind. It is clear from rocks, and will contain about 18 sail, in 5 or 6 fathoms at low water; but it is open to the north. The mark for running into the bay is, an inland hill, named Brown-hill,* kept on with the lime-kiln, on the west side, until the bank or cliff upon which it stands shuts in the high land behind it; this will be in about 4½ fathoms, clayey ground.

Shipping upon the coast, to the north of Runswick-bay, between it and the mouth of the River Tees, may clear the land all the way, by keeping Whitby Abbey open with Kettleness, the eastern point of the bay.

Here are different houses of worship; viz., an elegant church of the endowed religion, and several meeting-houses, belonging to presbyterians, quakers, methodists, Roman catholics, &c.

The name *Whitby* is a contraction of *White-bay*, the original appellation, derived from the white surges made by the breaking of the waves along the shore: so that the whole bay assumes a white or frothy appearance, to a person standing upon the opposite banks.

Between Whitby and Lyth, a small town distant about 4 miles to the N.W., is a beautiful level strand generally known by the name of *Whitby Sands*, upon which there used to be annual races; but now they are less frequent.—*Laing's Voyage to Spitzbergen*, page 2.

* This, with all the other marks, is shewn upon the Chart, by Mr. Pickernell; together with an accurate view of the coast, &c.

The remarkable cliff, called *Hunt-cliff*, lies 4 leagues to the north-westward of Whitby. The coast between is rocky, and the courses from Whitby are, therefore, N.N.W. 7 miles, and W.N.W. 6 miles. From Hunt-cliff, the bearing and distance to Hartlepool are N.N.W. ½ W. 3½ leagues, and to Suter-point N. ½ W. 8 leagues. Between Hunt-cliff and Hartlepool lies the entrance of the Tees, at the distance of 7 miles from the former.

RIVER TEES.—The Bar of the Tees lies between the sands named the North Gare and the South Gare, and has, on the middle of it, from 8 to 9 feet at low water. The channel within is marked out by numerous buoys and beacons, as shown hereafter. Half-way between Hunt-cliff and the Tees are the dangerous reefs named the EAST-SKARS and SALT-SKARS, the outer part of which lies E. by N. nearly one mile and a half from the middle of Redcar.

SALT SKARS.—The inner part of these reefs extend about two miles along the shore, W. by N. and E. by S.; southward of them are several rocky spots of two fathoms: there is, in particular, one called the *High*, which lies nearly in a line between the outer extremity of the Salt-Skars and Hunt-cliff point, at 2½ miles N.W. by N. from the latter. The Skars dry at half-ebb, one mile N.E. from Redcar.

In TEES BAY the ground is of clean sand, in from 10 to 6 fathoms. Those crossing the Bay, from the *northward*, must take especial care to clear the Salt-skars, by bringing Easington church without Hartlepool Heugh, till the west end of Barnaby Moor (W.S.W. ½ W.) be a quarter of a mile to the southward of Redcar. Should an adverse wind, from South or S.S.W., then render it necessary to come to an anchor, you may take shelter at *Skinnen Grove Wick*, to the eastward of Hunt-cliff foot, with the following marks:

Marsk church, which has a spire-steeple, just shutting in with Hunt-cliff foot, bearing W.N.W.; and Mr. Easterby's house, which is white, with a blue slated roof, in one with the lime-kiln standing on the eastern part of the swamp by the water-side, and bearing S.W. by S. With these marks is a good clay bottom, in 6 or 7 fathoms, and the best holding ground hereabout; but within, and along shore from Hunt-cliff foot to the Salt-skars, the coast is generally rocky.

The rock, called the *High*, above mentioned, lies nearly two miles, E.N.E. from Marsk, with only 12 feet over it, at low ebbs. The leading mark to sail clear without it is, two small houses, about a mile up the country over Redcliff, which are to be kept two or three ships' lengths without, or to the left, of Hunt-cliff. The same mark clears the Salt-skars, at a considerable distance.

Several vessels have been lost on the Salt-skars, from the masters' having mistaken the west end of Barnaby Moor for Hunt-cliff foot, and by not having a cast of the lead in time. To preclude such mistake, observe that, Huntly-foot is nearly perpendicular, while Barnaby Moor slopes gently to the westward, and upon the summit is *Captain Cook's Tower*. In the night, the low land cannot be seen; and this has caused the deception. The Salt-skars lie with the west end of Barnaby Moor bearing from S.W. by W. to W.S.W. ½ W., and should never be approached within 9 or 10 fathoms.

First, a *large red buoy*, with *staff and vane*, in 4½ fathoms, on the outside of the Bar, and a quarter of a mile without the *red buoy* on the edge of the Bar, which marks the deepest water there, which is about 8 feet, with a low ebb. These buoys may be left on either side.

The channel thence is, or lately was,* marked by eight black buoys on the western side, upon the edges of the *North Gare* and *Seal Sands* within a distance of three miles: and, on the South Gare, halfway between the second and third black buoys, is a white buoy.

Besides the buoys, there are two beacons, with triangular heads, on the southern bank, which, when in a line, and in one with Captain Cook's Tower, on the western summit of Barnaby Moor, (nearly S.S.W.) lead to the outer buoy. These may be seen, in clear weather, two or three miles off. At 2 miles above the outer beacons, are two others, on the left or S.E. side of the channel, called the *Clem* or *Stone Beacons*. These stand opposite to the last black buoy; above which, on the opposite side, is a single beacon, in another form, called the *Dagger's Beacon*, and a square-headed one above that, named

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* We say *lately was*, because the buoys are occasionally altered, according to the shifting of the sands.

Wood's Beacon. Three-quarters of a mile higher up, on the opposite side, is the *Yorkshire Beacon.* At two miles higher up, on the South side, from Wood's Beacon, is *Cleveland-port* or *Cargo-fleet Mill*, &c.* whence the river winds up to Stockton.

A pilot for the Tees may be obtained, by hoisting a Jack at the fore-top-mast head, at any time between half-flood and half-ebb. The pilotage is the same for the Tees as at Shields; viz. from the first of April to the first of October, one shilling and three-pence per foot; from the first of October to the first of April, one shilling and six-pence.—Strangers should be very cautious in entering, as the Bar frequently shifts.

TO SAIL INTO THE RIVER TEES, ON ADVANCING FROM THE NORTHWARD.

WHEN abreast of Hartlepool, and bound to the Tees, with the wind at N.W. or northerly, steer in till you have Darlington House at Hartlepool in sight.† This house kept just opening and shutting with the steeple end of Hartlepool church, and bearing nearly N. ½ W., will carry you to the bar of the Tees, where the outer beacons appear in a line, and in one with Captain Cook's Tower on the western summit of Barnaby Moor; the mark for the outer buoy.

The outer buoy, as already noticed, may be left on either side. The Bar buoy may likewise be passed on either side; you will now advance to the first black buoy on the starboard side of the channel, and may pass the rest as above described.

At a little above the fifth and sixth black buoys, a vessel may anchor in 20, 18, 15, and 12, feet at low water. The Road for vessels not drawing above 12 feet of water, is between the last or eighth black buoy and the Clem Beacons. If you intend to come here, having passed the fourth black buoy, haul up S.S.W.; and, if a flood-tide, with wind to the southeastward prevail, haul up to the windward of the fifth black buoy. The mark to lead you up is, a small tuft of trees, that appears like a house, which stands on a swamp at the west end of Barnaby Moor, over a barn that stands above Clem Beacons.—This mark will lead you above the fifth black buoy; then keeping a barn on the south shore to the eastward of the beacons, till the beacons are in one, will lead you above the sixth buoy, and over the *Stones* to the last black buoy, where you may anchor above it in 11 or 12 feet at low water.

If bound for the Tees, in the night-time, from the northward, steer in till Hartlepool Heugh bears N. by W. or North of you, by the compass. Come no nearer in than 5 fathoms, at low water. You may bring up with Seaton bearing W.N.W., and Hartlepool, N. ½ W., in 6 or 7 fathoms, sandy ground.

When coming in from sea, with the wind from the northward and eastward, endeavour to get the west end of Barnaby Moor at S.S.W. which will carry you near the first buoy; then the Gully Heads, or hollow of Barnaby Moor, will be a ship's length open.

SHIPS BOUND OUT FROM THE TEES to the southward, with the wind from East to S.S.E., may run down until abreast of Redcar; only observing that Coatham mill, (now in ruins,) kept in one with a farm-house, which stands to the westward of Coatham, leads outward, clear of the Salt-skars.

TO SAIL INTO THE RIVER TEES FROM THE SOUTHWARD.

In coming from the southward, if bound for the River Tees, from abreast of Huntcliff, steer N.N.W. ½ W. with a flood-tide, and N.W. by N. with an ebb, which will carry you clear of the Salt-skars: Or, if you can see the small round hill, which stands on the southernmost extremity of the high land in the county of Durham, called ELWICK BEACON, keep it over a high house on the north part of the village of Seaton, bearing N.W. ½ W. This will carry you without the Salt-skars.

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* Not far from Cleveland-port, inland, is *Marton*, the birth-place of that eminent navigator, *Captain James Cook*, in honour of whose memory the tower on Barnaby Moor has been named.

† Darlington House, at Hartlepool, the Duke of Cleveland's, is to the west of the church. It white, with a blue slated roof.

Being past the Salt-skars, keep Elwick beacon on the high house, on the north part of Seaton, as above-mentioned, will lead you in a fairway to the first buoy.

If coming from the southward in the night-time, take care not to bring Huntcliff-foot without S. by E. ½ E., or S.S.E., till the west end of Barnaby Moor bears S.W.; then you will be without, and to the northward, of the Salt-skars, and may haul into what water you please. Your course in a fair berth from Huntcliff-foot is, N.N.W. ½ W.; advance no nearer to it than in 9 fathoms, till you are past the Skars.

When you are a little to the southward of the Salt-skars, you will have 10, 11, 12, and 13, fathoms. You should be very careful, when standing into the Tees Bay in the night-time, or in thick weather, not to come within 9 fathoms, as it is very dangerous. Many have gone on the Skars, by not taking a cast of the lead in time. You may anchor in the bay to the southward, with the west end of Barnaby Moor at S.S.W., or S.W. by S. in 7 fathoms of water; it is good riding with the wind southerly.

When you are coming from the northward, with a northerly wind, keep in 5 or 6 fathoms, which will lead you without the *Long-skars:* and, when coming from the southward, with a southerly wind, keep in 7 or 8 fathoms of water, which will lead you without the *Salt-skars.**

HARTLEPOOL.—*The town of* HARTLEPOOL stands on a promontory almost surrounded by the sea.—The harbour, which lies within the town, is small, and was formerly of very little consequence; but it has recently been materially improved, with a new pier, flood-gates, &c., so that small vessels may now take shelter and lie here securely.

On the pier-head is a lighthouse, showing a *red* light; and ships coming from the northward will open this light when it bears W.N.W., and should not in the night time approach nearer the shore than in 6 or 7 fathoms at high tide; and when the light bears N.N.W. they may anchor if requisite. In proceeding for the harbour by day they must, after passing a chequered buoy, leave all the black buoys on the starboard side.

In the day time a *red flag* is hoisted at half flood, and continued until half ebb.

From the lighthouse the outer part of Hartlepool Heugh bears E.S.E. one quarter of a mile; the Longskar buoy S. ½ E. a mile and one-eighth; the chequered buoy of the Bar, S.S.W. ½ W., about 120 fathoms; and Red Cliff S.E. by S., 12 miles.

Since the establishment, in Dec. 1836, of the *red light*, above mentioned, a brilliant tide-light has been exhibited immediately below it, which is kept lighted from half-flood to half ebb. *Two red lights* have also been placed upon the dock walls, as a further direction; and in running for the harbour, when the pier-light bears N.N.E. ½ E., about 120 fathoms, vessels must steer in a N. ½ E. direction, until the two lights are brought in a line, bearing N. by W. ¼ W., which is the direct course up the channel to the entrance of the inner harbour. (*April* 20, 1837.)

Nearly half-way between Hartlepool and the River Tees is the ridge, called the *Long-skar*, which is nearly dry at low water. This ridge extends nearly east and west about a mile from shore, and must have a good offing. On its outer extremity is a black buoy.

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* PROPOSED HARBOUR at REDCAR, on the south side of the Mouth of the Tees, to be based on the Skars, and named PORT WILLIAM.

The first proposal of a Harbour of Refuge at Redcar was first, we believe, given in the '*Nautical Magazine*' No. 12, February, 1833, with the original plan of its projector, Mr. *W. A. Brooks*, civil engineer, on a large scale.

Explanations and other plans have since been given, in successive numbers of the same miscellany, as follow:—Nos. 13, 14, 15, 16, 20, 22, 23, 24, 36, 37, 38, 49; and New Series No. 2, Feb. 1837. Those, therefore, who wish to be perfectly acquainted with the subject, may take up and peruse the numbers consecutively, as above. In the number last mentioned is given a chart, showing, at one view, the intended plan of Port William, in comparison with the harbour of Kingstown in Dublin Bay, and the tidal harbours of Ramsgate, Bridlington, and Scarboro'.

According to the plan of this magnificent project, Port William would be, without comparison, the first pier-harbour of the United Kingdom: its area comprehending more than 500 acres: its entrance, on the S.E. 1000 feet in width: general depth at low water, 30 feet: bottom of blue clay, excellent for holding: more than three-fourths of the piers supported by the half-tide reef, or natural breakwaters, called the *Salt* and *East Skars*, on the north and south.

There can be no doubt that, vast as the undertaking may appear, it must certainly, in time, be realized. Its obvious necessity and practical advantages will fully justify this assumption. The vicinity of the mouth of the Tees, which has so long been notorious for shipwrecks, will then present a harbour, wherein 25 sail of the line or several hundred merchantmen may lie in perfect safety, after entering at any time of tide, and during the most dangerous gales on the coast.

If bound to Hartlepool, or Hartlepool Road, with the wind at North or N.W., give the Heugh a fair berth, till you bring Hart-mill (which stands on the high-land) over Hartlepool Pier. This mark will carry you clear of the *Stone*, a reef extending from the shore, south of Hartlepool. Then endeavour to get Stranton church over Row Houses, which stand between the two mills, close to the Sand-hills on the west shore; run in with these marks, till the third house from the Heugh, with four or five chimneys, called the Field House, be just open with the east end of the church; then drop your anchor in 4 or 5 fathoms of water. It is good clay ground, and a good road, with the wind at N.W.

If bound for the harbour, you may get a pilot on board, by hoisting your jack. There are 8 or 9 feet of water here, at high water, neap-tides.

The LONG-SKAR lies one mile nearly from Hartlepool, with the black buoy above mentioned on the outer end of it, which bears south from Hartlepool church; it is nearly one mile in length, and dries at last quarter ebb. The mark to clear the outermost end of it is, a high sand-hill to the northward of Hartlepool, over the methodist-chapel, which stands on the wall-end, at the west part of the town. The thwart-mark is, *Carr-house*, which is blue-tiled, with a chimney at each gable end, bearing W. by S. ¼ S. Keeping the chimneys open either way, will clear it.

SEAHAM.—The Loading port or Harbour of SEAHAM lies at the distance of 9 miles N. ¾ W. from Hartlepool, and 4 miles S.S.W. from Wearmouth. This harbour was formed, within the last few years, by the Marquis of Londonderry. A rail-road leads to it from the South Hetton colliery, a distance of about 4 miles, passing, in its course, across valleys, and through passages cut in the solid rock. There did not formerly exist, at Seaham, the slightest natural appearance of a harbour; but it is now a most convenient shipping station for colliers to receive their cargoes in safety. Two piers have been constructed, and a village has sprung up on the site where these improvements have been so successfully effected. An appearance of its coal staith and mode of loading is given in the Supplement to the '*Penny Magazine*,' No. 197, April, 1835.

SUNDERLAND.—The harbour of Sunderland lies N. ½ E. 5 leagues from Hartlepool. This harbour has, within a few years, been greatly improved. It has two excellent piers; and, in high spring-tides, there are from 16 to 18 feet, and in neaps 10 to 12 feet, water on the bar, at high water. Upon each pier is a lighthouse; the northern is 64 feet in height, the southern 23 feet, and the lanterns are 73 and 32 feet above the level of high water. The lights are brilliant and fixed, and seen at from three to six leagues off. The northern light is kept up during the night; but the southern from half flood to a quarter ebb only, or while the wind and tide are favourable for entering the harbour; and, with a westerly wind, it is put out at high water. By day a flag is hoisted during the same period of tide.

A plan of the port, in its present state, is given on the chart of the coast published by Mr. Laurie. Since the construction of the dock and other improvements, the coals are shipped by machinery placed on the kays, and other conveniences have been effected.

From the high lighthouse on Sunderland pier, Suter-point bears N.E. by N.; the outer end of Whitburn rocks, N.E. ½ N.; the north buoy of the roads, N.E. by E.; the south buoy of the roads, E.S.E.; the outer end of the south rocks, S.S.E.; and the outer part of Hendon rocks, S.S.E. ½ E.

The buoys for the roads are laid in five fathoms and a half, at low water. There is, likewise, a beacon upon the extremity of the rocks.

Of Sunderland, Mr. Holditch has said, the bar often shifts; but the channel, in general, is close to the North-pier. At this place, as well as at Shields, the wind has a strong effect upon the tides, often causing two feet difference in them. Strangers, if the weather be moderate, may always depend upon having a boat put off to them from the harbour.

TYNEMOUTH or TINMOUTH.—N.E. by N. 3 miles from Sunderland, is Suter-point; and, nearly N. by W. 5 miles from Suter-point, is Tinmouth-haven. This place is easily known, in the day-time, by the castle, in ruins, which stands on the northern side, and, in the night, by a revolving light, which is then constantly kept there. Near the lighthouse are the ruins of the old priory of Tynemouth, standing on a peninsula, formed of stupendous rocks, on the north side of the mouth of the Tyne, and to the east of the town of Tinmouth. The lighthouse is a tower of stone, in the castle yard, 62 feet high, with its

lanter

lantern 148 feet above the level of the sea. Its light is *brilliant* and *revolving;* in full lustre once in a minute, and may be seen at six leagues off.

The coast between Sunderland and Tinmouth is, in general, rocky; and must, therefore, have a good offing. On the north side of the river, at Tinmouth, the shore is also rocky to a considerable distance. On that side, just without, and opposite to, the little inlet called Prior's Haven, is a dangerous rock, called the Sparrow-Hawk; and, on the south side, is a shelf of sand called the Herd-sand.

Within the river, near the town of North Shields, are two lighthouses, for the use of vessels passing over the bar: these lead in the best of the water, which is close to the Herd-sand, on the south side of the bar. When coming from the northward, with a northerly wind, the two beacons on the south side, called the Law, will, by keeping them on, lead you close to windward until you bring the lighthouses on with each other.

The Lighthouses are white; the highest in front of Dockwray Square, the lower near Clifford's Fort, and bearing from each other W. ½ N. and E. ½ S., 720 feet. The lights are *brilliant* and fixed, at 183 and 77 feet respectively, above the level of high water. The upper tower is 49, and the lower 76, feet in height. The lights appear only from one-quarter flood to one quarter ebb, and a flag is hoisted in the day during the same period of tide. The lights may be seen from 5 to 6 leagues off. On the bar, at the lowest ebbs, are 7 or 8 feet of water.

There are three warping-buoys within the river, two on the south and one on the north, side. In addition to these there is, likewise, a distinguishing buoy without Clifford's-fort, on the north side, where the low light is situated; and, also, a post or beacon on the south side, near South Shields, upon which a flag is raised, at tide time, to signify that vessels may pass over the bar into the Harbour.

Within the bar there are 12, 14, 17, to 14, 11, 8, and 10, feet at low water. From the latter depth, when approaching to the warping-buoy on the north side, haul over to the S.W., so as to keep in mid-channel, in which will be found 11 and 12, to 18, 22, and 24, feet at low water, upward, to the town of Shields.

No vessels are permitted to hang at the post or anchors above a tide, wind and weather permitting them to sail in or out.*

Upon the bar it is high water, on the full and change, at about three o'clock, if the weather be settled; but a strong northerly wind will sometimes make it high water an hour sooner, and a strong southerly wind an hour later, than the regular course; also, there will be oft times 2 or 3 feet more water on the bar with a strong northerly wind than with a strong southerly one.

Vessels may anchor off Tinmouth-castle, in a depth of 7, 8, and 9, fathoms; with the castle by day, and the light by night, bearing W. by N.

NEWBIGGIN POINT lies 13 miles N. by E. from Tinmouth Castle; between are the small harbours of *Hartly* and *Blythe,* which are dry at low water. Off Blythe are some rocks, called the Sow and Pigs, that appear at the last quarter-ebb; and extending out a considerable way from the shore to the southward of Hartly-harbour, is a rocky point, or ridge, called Hartly-bates. The mark leading clear of the Sow and Pigs is, Tinmouth-castle open of, or without, the Bates.

At Blythe are *two harbour lights* on the larboard side, when entering the harbour, while there is a depth of 8 feet of water upon the Bar. They bear, when in a line, N.N.W., and may be seen at five or six miles off. A flag by day, as usual.

COQUET ISLAND.—Twelve miles N. by E. ¼ E. from Newbiggin-point lies the little island called *Coquet Island;* and, five leagues north of Coquet Island, is the headland called Sunderland-point, the north-eastern point of Northumberland. Between these places, at the distance of 4 miles to the N.W. of Coquet Island, is the little harbour or creek of Alnmouth, where small vessels take in corn, &c.†

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* When masters pay the port-dues, they commonly have a receipt, accompanied with a copy of the regulations, and a sketch or plan of the harbour.

† COQUET ISLAND.—We have been favoured with the following directions for the anchorage of Coquet Island, &c. Should circumstances admit, it will always be desirable to go round the north end of the island to this anchorage, the passage being much less intricate than on the south *side*

From **TINMOUTH CASTLE** *to* **North-Sunderland Point**, the direct bearing and distance are N. ½ E. 11 leagues and a half. To the northward of this point lie the islets called the Farn Islands; without which lie those remarkable ones called the Staples; and within, upon the main, are the remarkable and extensive remains of Bambro' castle, &c.

The direct course and distance from Tinmouth-castle to the *Staples* are N. ½ E. 12½ leagues.

STAPLES, FARN ISLANDS, *and* OPPOSITE COAST.

The Staples, Farn Islands, and opposite Coast of Northumberland, have been surveyed by Captain Edward J. Johnson, of the Royal Navy, whose survey is comprised in a Chart of the coast, from Sunderland Point to Berwick, including Holy Island, &c. The remarks and descriptions of Captain Johnson are contained in the subsequent paragraphs.

The repeated cautions which have been given to mariners, not to involve their ships among the intricacies of the dangerous navigation of the Farn Islands, both by the Corporation of the Trinity-House and others, cannot be too strictly attended to; but the numerous dangers delineated on the Chart will serve at once as a warning against unnecessary risk and temerity, and afford assistance, should stress of weather, or other causes, involve vessels among the islands, especially as those of the coasting trade are continually seen there.

Before we proceed to give such directions as may be useful when ships are involved among the islands, it will be necessary to describe the nature of the Coast and Islands, in order that the several objects, used as marks to point out the dangerous rocks and shoals, may be more easily distinguished.

North-Sunderland Point, or the Snook, is formed by a low cliff, having rocks projecting to the eastward from it, which are partially covered at high water: near to the cliff are the remains of a windmill, appearing like a small round tower. The coast from the point, a mile to the north-westward, is of the same description; and thence, to the northward of Bambro' Castle, it is sandy, and irregularly interspersed with rocks.

The *Grimstone*, a rocky shoal on which the sea breaks, is situate about a quarter of a mile east of the rocks extending from Sunderland Point. In order to avoid it, vessels must, therefore, be kept at more than that distance from the point, and not advance into less than 8 fathoms at low water.

At about a mile to the N. by W. from Sunderland Point, and a quarter of a mile from shore, lie the *Outcars*, a reef on which the sea generally breaks, and which is uncovered at low spring tides. To the west of this reef the shore becomes sandy.

About half way between the Grimstone and Outcars is the small pier of North Sunderland, with what are called Sunderland Sea-houses. These are situated about half a mile north of Sunderland Point, close to the beach, where there are a pier and a small dock, which is dry at low water, and has 13 feet in it, at high-water, spring-tides, and 7 feet at high-water, neap-tides. The rocks on which the pier is founded, and also those to the southward of the entrance, which project a considerable distance to the eastward, dry at low water.

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side. Being to the north and eastward of the island, bring Bondicar-point to bear S.W. by S., then run directly for it, taking care, however, to keep it open with Hawksley-point, in order to clear the Pan Bush; run in this direction until the Old Tower in the island bears S.E. by E., and Bondicar-point shutting in with Hawksley; you will then be in a good anchoring berth, with not less than four fathoms at low water. Being to the southward and eastward of the island, and not able to weather it, bring the old Tower on the Island to bear N. ½ W.; then run directly for it until you bring the centre of Warkworth Castle on with the chimney of the Old Ruin at Amble Pans, coming not nearer the island than a good cable's length: run with these marks on till the Old Tower on the island bears S.E. by E.; then anchor as before.

In thick and hazy weather, when the marks may not be visible, run in on the south side, bringing the Tower to bear N. by W., and run directly for it, to within a little more than a cable's length of the island; then keeping about that distance, bring the Tower to bear N.E.; from which steer N.W. till it bears S.E. by E.; and you will be at the anchorage.

It may be worthy of observation, that, on the first half of the flood, the tide sets directly into Druridge Bay: and vessels coming from the southward have oftentimes, (in consequence of this,) with a fair wind and thick weather, got upon Bondicar Rock, by not keeping a sufficient offing: this may be prevented by making use of the lead, and not to come nearer the land than in 15 fathoms. The influence of tides is here excessive, and every navigator traversing this very dangerous part of the sea, should be perpetually sounding; the neglect of it has been the destruction of innumerable vessels and lives. To guard against this fatal coast, in thick and hazy weather, it is very desirable that a gun or bell were placed on the island.

The southernmost building, which is longer, and stands lower than the rest, covered with red tiles, and fronting the east, is the *Herring House*; at the south end of which there is a post placed, at about three yards distance from it; the leading-mark between the rocks until you come to the Pier-head, is to see the space between the post and end of the Herring House. The long houses on the western side are granaries.

There are two small wooden beacons on the south side of the entrance for warping out by. At the west end of the Pier are lime-kilns, where vessels load with that article, and also with corn, for various parts of the coast.

Hovel House is a small house near Sunderland Sea-houses on the south; and North Sunderland is a considerable village, half a mile west from the Sea-houses.

Shorestone consists of a farm-house and small village, north of Sunderland Sea-houses: between the two last-mentioned places there are the remains of a windmill, similar to that on Sunderland Point, and not far southward from this, near the shore, is a high steam engine chimney.

NEW SHORESTONE, a new house and offices, covered with blue slates, west of Shorestone.

MONK-HOUSE is situated about half-way between Sunderland Sea-houses and Bambrough Castle, close to the beach: it is covered with red tiles; but is now going to ruin. There is a landing-place between the rocks, and fresh water.

ELFORD is a small village, on a rising ground, at a considerable distance to the westward of Monk-house; it has trees about it, and a flagstaff on a mound.

SADLERS' HALL is a small house, covered with red tiles, near New Shorestone.

NEW BURTON, a white house, covered with blue slates, west of Monk-house. Burton is west of it.

GREEN HILL is situated north of Monk-house: it is a farm-house, with offices. To the west of it there is a small house, called *Fowberry-house.*

The BARNS are two or three small houses, covered with red tiles, between Green Hill and Bambrough Castle.

BAMBRO' CASTLE, situate at rather more than three miles N.N.W. ¼ W. from North Sunderland Point, is founded on a rock of considerable height, near to high-water mark, having sandhills to the N.W. and S.E. of it. At a distance, it has not the appearance of a ruin, the high and principal tower (which is square) being perfect, and, with other parts of the castle, inhabited. There is a windmill on its N.W. end, and a battery of twelve guns at the N.E. part of the ruin, the principal direction of which is toward the N.E. At a little to the west of the castle is the town of Bambro'. The turret on which the flagstaff is erected is 208 feet high, above high-water.

Westward of the castle is the village of Bambro', with a neat church, having a steeple useful as a mark.

To the N.W. of Bambro' Castle are the *Budle Hills*, extending to the westward along the south side of Warnham Flats; on or near the north-eastern extremity of which is a small white house, covered with red tiles, which is called the *Signal House.*

The country, in the immediate neighbourhood of the coast between Sunderland Point and Bambro' Castle, is flat; but, a few miles inland, it rises to a hill, or ridge, of cultivated land, extending parallel with the coast. At a considerable distance to the south-west of Sunderland Point is *Heffer-law Hill,* remarkable as having a plantation on its northern summit, and apparently a house at its southern, the land sloping gradually to the southward; and to the northward, after forming a curve or hollow, it rises again to a higher and more extensive hill, and then declines to the level of the before mentioned ridge; on the north part of which, but to the south-west of Bambro' Castle, is *Hebbron Hill,* which, being higher than the ridge, and uncultivated, may be easily known. The tops of some of the Cheviot Hills, which are much higher and larger than Hebbron, are seen to the N.W. or inland from it; on the northern declivity of the largest is a Currach.*

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* A heap of stones piled up to a considerable height, as a mark to the shepherds when the hills are covered with snow.

The ISELSTONE, a reef of rocks, is situated to the S.E. of Bambrough Castle, projecting a considerable distance to the eastward of it; and is covered at half-flood.

At the point northward of Bambrough Castle, there is a reef of rocks, projecting a short distance to the eastward.

To the north and south of Monk-House there are also rocks.

GLORORUM is situated to the S.W. of Bambrough, and stands higher: there are two or three trees, which are conspicuous, standing to the east of it. Between it and Bambrough there is a small house, called *Dukesfield*. A high steam chimney at Glororum is useful as a mark.

The Black Rocks, a broad reef, lie at two-thirds of a mile N.N.W. from Bambro Castle, and extend outward from a projection called Black Rocks Point, almost half a mile. The Herring House at North Sunderland kept open to the eastward of the sandhills, to the south-eastward of Bambro Castle leads clear of them.

Budle Point is six-tenths of a mile N.W. ½ W. from Black Rocks Point, and forms the south side of the entrance to *Budle Creek.* At a little way within the point is a long granary, covered with red tiles, and near it is a small pier communicating with the creek, for entering which, a beacon, S.W. of the pier, is useful. Budle is a very small village, and over the trees are seen the chimneys of the mansion house.

Westward of Warnham Flats are the Chester and Easington Hills, with two or three good farm houses, having near them steam engine chimneys. The latter must not be mistaken for Outchester tower, which is lofty, and situated to the southward. At the southern angle of Warnham Flats, are a mill and granary, with *Warren House,* which is white, with some trees near it, useful as a mark.

WARNHAM FLATS are covered with the tide, and dry at low water, excepting two little streamlets, which unite and run into the sea at Warnham Bar, through an opening in the sands. Easterly winds produce frequent changes in this opening; so as to render an examination of it requisite, before attempting to enter.

The small rivulets commonly called Ross and Warnham Waters, the former running from the N.W. and the latter from the S.W. angle of Warnham Flats, join before they come to the pier, and run from thence in a line to the bar; but their united depth is so inconsiderable, that no vessel can sail in them at low water; consequently, the time of tide must be considered before entering. There is a small coasting traffic in corn carried on from hence.

The **FARN ISLANDS** are two groupes of rocky islands, situated to the eastward of Bambrough Castle. There are two passages, through which ships may sail; the principal of which is between Farn Island and the main land; and the other between the Farn and Staples, hereafter to be described. The easternmost rock, which is the *Knavestone,* is more than five miles distant from Bambro Castle.

These islands, like all others where there is a considerable rise and fall of tide, present very different aspects at high and low water. At high water the navigation has an easy but deceitful appearance, while the ebb and the storm reveal the numerous dangers and impediments which surround the islands.

The Passage between Farn Island and the main-land is called the *Inner Sound,* and that between the two groupes *Staples Sound.*

FARN ISLAND is the nearest to the mainland; it is the highest of the cluster, having a high rocky cliff to the S.W. and sloping to the N.E. side. On this isle are *two light-houses,* of which the upper one is about 80 feet from the S.W. cliff, coloured white and the lantern red, and the reflectors 82 feet above the level of high water. Its light is brilliant and revolving, showing the full face of a reflector, all round, every thirty seconds. The low light, which is a fixed light, is near the N.W. point of the island, and bears N. by W. ¼ W. from the high light; its lantern is painted red, and its height above high water, is 38 feet. The light shows in a northerly direction only, and is not visible from the southward.

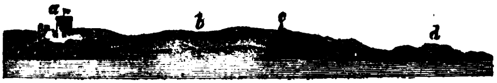
Near the north-east part of the island, there is an old square building, called St. Cuthbert's Tower, which, before the erection of the present light-houses, was used for the same purpose: near to it is an old house, apparently made out of the ruins of a chapel. The surface of this island is covered with grass. At a short distance to the eastward of th light-house is a cavity in the rock, with a hole above, through which, in N.E. gales, the sea is forced, and forms a beautiful jet d'eau, which is called the *Churn.*

The Wide Opens are two rocky islets, situated to the E.S.E. of the Farn: they have rugged cliffs to the south-west, and slope gradually in a contrary direction.

The Scare Crows are two black rocks, always above water, a little to the eastward of the Wide Opens.

The Bush is a reef of rocks, extending from the Scare Crows about a quarter of a mile to the E.S.E.: its S.E. end is visible at low water, spring-tides; and, in S.E. gales, the sea breaks violently on it. The marks for the S.E. part of it are, the windmill, on the north end of Bambrough Castle, on with the S.E. high cliff of the easternmost Wide Open; and the south end of the granaries, at Sunderland Sea-houses, open to the north of the plantation on Heffer-law Hill; and Kyloe Church on with the highest part of the easternmost Scare Crow. And, for the easternmost part of it, the highest and principal tower of Bambro Castle on with the high light-house on Farn Island; and the Herring House, at Sunderland Sea-houses, on with the hollow to the north-west of Heffer-law Hill; or, the plantation well open to the southward.

Mark for clearing the Bush, &c.—Budle signal-house open to the southward of Farn Island, bearing W.N.W.



a. Bambro' Castle.—b. Budle Signal-house.—c. The high light-house on Farn Island.—d. St. Cuthbert's Tower.

To the northward of the Wide Opens, there is a reef of rocks, extending to the eastward, nearly half-way between them and the Staples, called by the fishermen *Knox's Reef:* its S.E. end is visible at low-water, and deepens gradually, to the eastward, to 12 fathoms, in mid-channel, (hereafter to be described.) The marks for its east end are, the low light-house on Farn Island on with Hebbron-Hill, at which position the low light will appear open to the northward of St. Cuthbert's Tower, and the plantation on *Heffer-law Hill* touching the S.E. and low part of the easternmost Wide Open. The north-western part of these rocks extend toward the Farn, in a semicircular form, thereby forming a little basin, having from 7 to 12 feet of water in it, at low water, and sandy bottom; it is called *The Kettle:* its entrance is to the northward; and, when sailing into it, keep in mid-channel between the north-east point of Farn Island and the N.W. point of *Knox's Reef*, which is always visible, at which time you will be steering for the high part of the west Wide Open; and, when abreast of St. Cuthbert's Tower, you may anchor, remembering to attend strictly to the soundings, and to make the necessary allowance for the time of tide.

The MEGSTONE is a black rock, about 16 feet above high water, and having its highest part to the N.E.: it lies about a mile from Farn Island, in a N. by W. direction. From the Megstone, in a W. by N. direction, there is a reef of rocks, extending half a mile, which is partially dry at spring-ebbs: it is called the *Swadman;* and, near its extremity, there is a black buoy, in 7 fathoms, which bears from Farn high light-house N.N.W. ¾ W. one mile and a quarter.

The Oxcar is a small rock, about 6 feet above low water, and half a mile E.N.E. of the Megstone; N. ¾ E. from Farn high light-house; and W. ¾ N. from the Longstone, described hereafter. A short reef extends from it to the westward, and is visible at low water.

The Elbow is a small rocky shoal, of only 2 feet at low water, which lies much in the way of vessels passing between the Oxcar and Megstone, being only 500 yards E. ½ S. from the latter. It bears north one mile, from the Farn high light.

Glororum Shad is a shoal nearly half a mile to the eastward of the Oxcar. It has not less than 2½ fathoms over it at low water, and lies with the Longstone light-house E. ½ S., and the Farn high light S.S.W. ½ W. more than a mile.

To the N.E. of Glororum Shad there is much foul ground, though sufficiently deep; but the marks for one spot, having a depth of only 5 fathoms, are, Bambro' church in a line with the Megstone, and the ruins of the mill on Sunderland Point in a line with the east point of the Western Wide-Open.

The Iselstone Shad, a small rocky patch, with but 9 feet at low water, lies between Glororum Shad and Knox's Reef, with the Farn high light-house bearing S.W. ½ W. nearly a mile, and Longstone light-house E.N.E. ¾ E. one mile and a half.

STAPLES.—The island called the STAPLES, is the westernmost of the outer groupe of islands, and is of a triangular shape, having the remains of a square building on it, which was formerly used as a light-house; its southern side is a rocky cliff, near which are some perpendicular rocks, appearing like pillars, called the Pinnacles. This island is covered with grass.

A little to the N.E. of the Staples is *Brownsman Island*, which is of a long irregular shape, having the remains of a light-house near its north end, bearing from the high light on the Farn E.N.E. Near to the remains of the light-house, there is, or *lately was*, a square tower and an old house covered with red tiles.

To the northward of the Brownsman, there are two islets, called the *Wamses*, which are connected at low-water; and there is a shoal, projecting a short distance from their N.W. point, in that direction.

Gun Reef.—From the S.W. point of Staples Island two patches of rocks, called the *Gun Reef*, curve round toward the northern end of Brownsman Island. The sea-weed along this reef may be seen at low ebbs; and two small rocky heads show themselves at about two hours ebb.

The LONGSTONE, so called from its form, is situated more than three-quarters of a mile E.N.E. from the remains of the light-house on Brownsman Island. At low-water it is one island; but, at high, it is separated in several parts. Its eastern side is the highest, and formed of rugged rocks. The light-house on this island, heretofore mentioned, stands on the western side of it, and is painted red. The tower stands about 200 yards W.S.W. from the water's edge, and the light is 75 feet above the level of high-water mark, spring-tides. This light, like that in the principal tower on Farn Island, revolves, and shows the full face of a reflector every 30 seconds. They bear from each other W.S.W. and E.N.E. There is a shoal extending from the N.E. point of the Longstone, a short distance in that direction.

Between the Longstone and Wamses, there are several small black rocks, which join each other at low-water, called the *Blue Caps*, and a larger island called *Hawkers*; to the north of which, and between the above-mentioned islands, there is a rocky shoal, extending the whole distance.

The KNAVESTONE or NAIVSTONE, is the easternmost rock: its top is 11 feet above low water, and is visible at two hours ebb; it is nearly half a mile distant from the Longstone, in the direction of the two principal light-houses in one bearing, which is nearly W.S.W.

The Whirl Rocks project a quarter of a mile to the northeastward of the Knavestone, and one of them has only two feet over it, while the others have from two to four fathoms. The Longstone light bears from them S.W. by W. ½ W.; but as the tides near these rocks and the Knavestone are extremely rapid, and whirl in various directions, vessels should never approach them within the distance of two miles.

The CRUMSTONE is the southernmost of the islands: it is about a mile to the south-eastward of the south part of Brownsman Island; it is always above water, is black, and appears flat. A reef of rocks, called the *Callers*, which are visible at low-water, spring-tides, stretches from the west end of it, more than a quarter of a mile toward the opening between the Staples and Brownsman. In the passage between are 16 and 18 fathoms of water.

The Fang, a small rock, of 9 feet at low-water, lies at about a cable's length S.W. by W. ½ W. from the Crumstone, with the south part of Bambro castle in one with the north part of St. Cuthbert's tower on Farn Island.

DIRECTIONS for the Passage between the Farn and Staples.

The passage between the Farn and Staples is more than half a mile broad, and may be of great advantage, when the wind is in such a direction that vessels cannot pass outside or to the eastward of the Knavestone; but, by sailing through this passage, they may still be enabled to pass outside of the Oxcar and other shoals, when bound to the northward; and it insures a good offing, when bound to the southward.*

Before we proceed to give a description of this passage, it will be necessary to caution vessels against being steered for the *apparent* mid-channel, between the Scare-crows and the Staples; for the *Bush*, *Knox's Reef*, and *Iselstone Shad*, which are not always visible, extend to the eastward nearly half-way across this *apparent* channel; therefore, let it be remembered, always to keep well toward the east side of it; when, if the Gun Reef can be seen, there will be no danger of mistake.

As there appears to be no very distinguishable leading-mark, and as any other than that which is so, serves only to puzzle instead of to guide, I shall proceed to recommend particular attention to the soundings; there being, in mid-channel, from 11 to 13 fathoms, shoaling to the eastward to 9 and 7, which is close to the Gun Reef; and, to the westward, to 3 and 2, which is close to *Knox's Reef*, which, with *Iselstone Shad*, and the *Bush*, are the principal dangers in the passage; the two last mentioned having 6 fathoms close to them. The direct course, by compass, when in mid-channel, is North and South. The breadth of the passage is more than half a mile.

In leading winds, when coming from the northward, or after bearing up, when not able to weather the Knavestone, give the N.W. point of the Wamses a good berth, to clear the shoal; and, when you suppose you are a little to the westward of the Gun Rock, steer south, remembering to attend to the soundings, and keeping nearer to the east than to the west side of the passage.

In approaching it from the southward, or after bearing up, when not able to pass to the eastward of the Knavestone, remember to keep clear of the shoal that extends from the Crumstone, which you will do by keeping nearer to the Staples than to the Crumstone, and steer on, until you suppose you are a little to the westward of the Gun Reef, and then steer north. You must not round the S.W. point of Staples Island too close, as there is a shoal extending toward the Gun Rock from it.

In beating winds, stand no farther to the westward than to 6, and to the eastward than to 9 fathoms; taking care not to bring the marks for any of the shoals on; viz. when approaching the north part of the passage, and when standing to the westward, tack before the mark for Glororum Shad comes on, (see page 84;) and, when in the line between Bambrough Castle and Brownsman light, tack before the mark for *Iselstone Shad* comes on, (see page 85.)

In the middle part of the passage, in standing to the westward, tack before the mark for the easternmost part of *Knox's Reef* comes on, (see page 84;) and, when standing to the eastward, tack before the mark for the westernmost part of the Gun Reef is on, (see page 85.)

When in the south part of the channel, and standing to the westward, tack before the mark for the easternmost part of the Bush comes on, (see page 84.) In this part of the passage, you must not stand to the eastward of the Gun Reef.

When the windmill on Bambro Castle is well open to the southward of the southeast cliff of the Eastern Wide-Opens, you are clear of the southernmost part of the Bush, and may stand farther in-shore, if deemed necessary.

The tides run north and south in this passage.

ANCHORAGES in and about the FARN ISLANDS.

ON the south side of Farn Island, that is, between its S.W. point and the easternmost Wide Open, there is anchoring-ground in 10, deepening to the southward to 13, fathoms, sandy bottom.

The marks for the best holding ground are, Holy Island Castle on with the high or S.W. cliff of Farn Island, and the Megstone seen through the opening between the Farn and the Wide Opens, or the Megstone seen open to the eastward of St. Cuthbert's Tower: this position enables you to clear the S.W. point of Farn Island, or the Bush, in case of a sudden change of wind. This anchorage is to be used in northerly winds.

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* These remarks are not intended as an encouragement to draw ships among the islands.—E.J.J.

Supposing a line to be drawn from the south part of Farn Island to the Bush, all to the north of it is rocky bottom, consequently no anchorage.

To the southward of the Brownsman and Staples Islands, there is anchoring-ground, on sandy bottom, in 12, deepening to 14, fathoms, to the southward; the marks for the eastern and western extremities of which are, the remains of Brownsman lighthouse on with the west and highest cliff of Brownsman Island, for the eastern, and the remains of the same lighthouse on with the remains of the old lighthouse on Staples Island for the western, extremity of the ground. The softest bottom is about 300 yards from the Islands, and between the west cliff on Brownsman and the Pinnacles. This anchorage is also safest in northerly winds; but the water is smooth here in westerly gales.

To the north of Farn Island, there is a small spot of anchoring-ground, shingly bottom, in 8 and 8½ fathoms of water; the marks for which are, the westernmost of the Sunderland Sea-Houses open of the N.W. point of Farn Island; and the Barns (see page 82) on with *Hebbron Hill;* at which position you will appear to be half-way between the low light and St. Cuthbert's Tower.

The extent of the ground is small, as all to the westward of the low light, and all to the eastward of St. Cuthbert's Tower, is rocky. This anchorage is to be used only in southerly winds.

It will be seen, by the nature of the bottom, that these anchorages are recommended as a tide roadstead only, or in cases where no other alternative presents itself.

THE COAST CONTINUED, from WARNHAM FLATS to BERWICK, including HOLY ISLAND.

From WARNHAM FLATS, which have been described, the coast trends N. ½ W., a mile and a half, and is formed by a sand-ridge, called the *Links,* covered with bents or long grass, with a beach in front, nearly a quarter of a mile broad. A narrow islet, called the *Old Law,* nearly three quarters of a mile in length, follows to the northward of the Links, being separated from the main-land by a gap *(the Wide Opens)* admitting the water of spring tides.

On the northern extremity of the Old Law are *two beacons,* which kept in a line and bearing W.N.W. ½ W., form the leading mark over the bar of Holy Island Harbour. These beacons are of one form, being obelisks of brick, each crowned with a wooden triangle. The eastern is 77 feet high above high water mark; the western 102 feet. Within two cables' length N.N.E. from these beacons, is a little islet of gravel, called the *Black Law,* which also serves as a mark, and is connected by the bank to the Old Law, at low water.

FENHAM FLATS, which fill up all the space between Holy Island and the main, are traversed by a small rivulet, called the *Low;* and although they are passable for foot passengers, in certain directions, when the tide is low, they are entirely covered at high water. The operation of the tide on these flats is shown in the description of tides hereafter.

Near Fenham granary, on the western side of the flats, small vessels may approach at high water, and take the ground safely, near the wooden posts called *Dolphins,* erected there for the purposes of warping and securing.

In APPROACHING HOLY ISLAND, &c., the following objects, which serve as principal marks for the different channels and dangers, will present themselves to the eye of the mariner. From different points will be seen *Hallidown Hill,* the southern end of a high ridge of land, stretching from Ross Point, near Eyemouth, to Berwick. *Wingate Gap,* a wide gap in the highest ridge of the western land, bearing W. by N. from Holy Island Castle. From a little to the northward of the Plough and Goldstone, hereafter described, this gap will be seen over the castle. On the same ridge, at a little distance south of Wingate, are two little notches called the *Scores;* and on the ridge, at nearly the same distance north of Wingate, stands *Kyloe* or *St. Nicholas' Church.* From a situation to the northward of Holy Island, this church appears below the ridge.

At some distance below the ridge, and nearly half-way between Wingate Gap and the Scores, are a cluster of trees, called *Kyloe Trees,* with the houses of Kyloe to the northward.

The Kyloe hills, which rise about two miles from Fenham Flats, are barren: but, on high green hill, a mile to the north of Kyloe church, is *Low Lin*, a small mansion with trees near it, and useful as a mark. Between Low Lin and Biel Point, opposite the west end of Holy Island, stands the village of Biel, on a rising ground, with trees to the northward and eastward. A steam-engine chimney at this place is a good distinguishing mark for vessels in Berwick Bay.

There is nothing very remarkable in the general appearance of the land between Fenham Flats and Berwick-upon-Tweed: the principal objects on it being farm-houses, windmills, engine chimneys, and lime-kilns. In the vicinity of the coast are Haggerstone Castle, the Mead, Brock Mill, Ladythorn, Cheswick, with its windmill, and the three Scremerston windmills. At Windmill Hill there is now no windmill. Farther on is Berwick Hill colliery, which may be known by its engine chimney and a few small houses on the hill which rises from *Spittal*, a large fishing village at the entrance of the Tweed, and *Tweed-Mouth*, a town on the west bank of the river, considered as a suburb of Berwick.

A chain of small sandy shoals extend along the low water line from the sandy beach of Holy Island as far as Cheswick. These are succeeded, northward, by a narrow border of sunken rocks, and the coast rises into cliffs, which at Maiden-Kirk Point are 87 feet above high water mark, and which terminate in Hud's Head, where is an engine house. From Hud's Head a broad beach curves out in front of Spittal, and generally points toward the lighthouse on the pier-head of Berwick; but it shifts, both in extent and direction, with every gale of wind, and throws up sand-banks to seaward.

BERWICK is a town, antiently fortified, on the N.E. side of the river Tweed; it stands in latitude 55° 46′ 20″, and in longitude 1° 59′ 40″ West of Greenwich. The town, being on the Scotish side, antiently belonged to Scotland, although now within the limits of South Britain. It is well situated, but irregularly built, on the declivity of a hill, which slopes down to the river. It contains about 9000 inhabitants, and owns more than 5000 tons of shipping. The town is still partly fortified, and outside the modern works many traces, now covered with grass, may be seen. A spire on the town hall, an octangular building, called the *Old Bell tower*, northward of the town, and the *Magdalen field house*, near the same, are all conspicuous marks.

From the outer point of the river, on the northern shore, a pier of nearly 800 yards in length extends to the South and S.E., but the rocky bed on which it stands, and the swell thrown in by easterly gales, prevent vessels from lying alongside of it in security. On the pier-head is a *lighthouse*, a neat circular building with a conical roof, the ball on the top of which is 55 feet above high water mark, and 44 above the pier. The light, which is brilliant and fixed, shows well to the distance of four leagues, in all seaward directions, from N.E. by N. round to the southward; and in the same tower is a second or tide-light, colored *red*, which is placed 20 feet below the bright light, or 13 above the pier, and exhibited so long as there are 10 feet of water on the bar.

On the S.W. or Spittal side of the river, nearly a mile within the outer bar, a large sandstone rock, called the *Carr*, projects from the shore, and about it is the deepest water and best anchorage in the river. Vessels generally moor there with a fast to a ring in the rock, and an anchor in the stream.

The business of the port is carried on, principally, at the Kay, on the Berwick side of the river; but there is only one spot there, near the bridge, where a vessel drawing 13 feet can float at low water. At the entrance end of the Kay there is a slip, and near it a ballast kay.

The bed of the river is frequently strewed with large stones, and near the western angle of the pier is a small patch of rock, called the *Crabwater*, nearly visible at low water of spring-tides.

To the northward of Berwick Pier the coast appears like a mass of irregular reefs, projecting nearly half a mile into the sea, from cliffs of clay, which in some places rise to 58 feet in height; the reefs present an impassable barrier to the shore, and may be avoided by keeping the Scremerstone windmills in one, or very cautiously approaching by the lead at night, not within 10 fathoms at low water.

The *Seal Carr*, which is a mile and $\frac{1}{10}$ to the northward of Berwick lighthouse, forms the N.E. extremity of this dangerous portion of coast. It bears N.E. by E. $\frac{1}{2}$ E. a quarter of a mile from Bottleness or Sharper's Head, with which it is connected at low water. From this head a long ridge of cultivated land extends to Ross Point, near Eyemouth, rising a few miles inshore to a range of hills which begin at Hallidown and terminate in Lammerton Hill, a distance of between two and three miles.

HOLY ISLAND.—Holy Island (antiently *Lindisfarn*) is a pleasant fertile island, the greater part of a quadrangular form, but having a long arm of sand and sand-hills extending from its north-western portion to the W.N.W. The main body of the isle is based on rocks which, on the eastern and northern sides, extend to a considerable distance into the sea.

On the S.W. part of the island is the village of *Lindisfarn*, inhabited chiefly by fishermen, including 40 pilots under the jurisdiction of the Trinity House of Newcastle. The population of the island is about 800. This was once a bishopric, founded in 635, but afterward united to Durham. The remains of its once stately cathedral still serve as a sea-mark; and there are, also, a church and look-out. Near the S.E. point is an old castle, on a picturesque rock, 108 feet high above the level of high water, which is a very conspicuous object: but, exclusive of the castle rock, the island is a continuous plain, inclining to the S.W.—The N.E. point of the island is *Emanuel Head*, on which is a sharp pointed pyramid, built of stone, and near to high water mark, whence many rocks and large stones extend out nearly a quarter of a mile.

The north coast of the island forms two sandy coves, bordered with rocks: the first point westward of Emanuel Head is called *False Emanuel Head*, and the second *Snipe Point*. From Snipe Point an extensive reef stretches to the N.E., near which the flood-tide makes its earliest advance through a narrow channel called the *Swinnow Gat*. A rocky cliff, called the *Coves*, reaches to the False Head, and from all this northern shore of the island dangerous reefs project irregularly to seaward.

The Entrance of the Harbour is between the S.E. point of the island and the flats which extend from the Old Law. This harbour has a spacious aspect at high water, but is much contracted by the ebb. On entering, with the beacons on the Old Law in a line, as before noticed, you will sight the *Heugh*, a dark green hill to the westward of the castle, which terminates westward in a rocky cliff: on the middle of this Heugh is a wooden beacon, with a triangular head, and a staff for signals: near the western extremity of it is a small building without a roof, which is the *Look-out;* to the northward of the latter are the ruins of the cathedral; and to the west of the ruins is the church, the belfry of which is a useful mark for sailing into the harbour, as will be shown hereafter. The town lies to the northward of the cathedral.

At something more than a cable's length from the western point of the Heugh is a small rocky projection, which, at high water, appears like an islet, but is seen connected to the Heugh ridge when the tide is low. It is called *St. Cuthbert's Isle*, and is the *Hob Thrush* of the pilots.

The breadth of the anchorage off the Heugh is only two cables' length; but it is so well sheltered and secure that the water is smooth with easterly gales; though with the wind from the westward, when Fenham Flats are covered, there is some sea.

The depth on the Bar, at low water, of ordinary spring tides, is 8 feet, and there are from 4 to 2 fathoms at the anchorage abreast the Heugh. During equinoctial or extraordinary spring ebbs there are two feet less.

The south side of the entrance to the Harbour is a beach of sand and gravel, but there are several rocks near low water mark, named the Bat, Parton Steil, Law Scape, &c. On the north side are the Ridge-End, Burrows, Stone Ridge, Wheel, &c., all of which are distinctly shown in Captain Johnson's Survey of the harbour.

SHOALS between the Farn Islands and Holy Island.

Between the Farn Islands and Holy Island are several patches of rocks and shoals, lying to the eastward and north-eastward of Holy Island Harbour. These are, the *Tree o' the House*, *Gussard's Seat*, *Stiel* and *Goldstone*, and *St. Nicholas Rock*, forming the Eastern groupe; while the Western is formed by the *Minscore* and *Wingate Rocks* and the *Plough-seat*. These we shall take in order, as follows:

The *Tree o' the House* is a rocky spot, with 4½ fathoms, lying with St. Cuthbert's Tower, on Farn Island, just to the westward of the highest part of the Megstone, S. by E. ½ E. nearly three miles; and, the largest new house at Outchester in a line with the granary at Warren Bridge, S.W. by W.

Gussard's Seat, a rocky shoal, of 12 feet at low water, lies N. by E. half a mile from the Tree o' the House, and extends to the westward almost to the line of the Farn lighthouses over the Megstone, where it deepens to 3 fathoms. The marks for its centre the easternmost part of the Megstone in a line with the western part of Farn Island, and the pyramidal beacons on the Old Law W.N.W. ¼ W., in a line with the south part of Wingate Gap.

The *Goldstone* is a dangerous rock, half a mile North from the Gussard's Seat: its highest part shows only 4 feet above low water, and is visible for 2½ hours only. It lies with the Look-out on the Heugh just touching the south side of Lindisfarn Castle, (which will then appear between the cathedral and the beacon on the Heugh,) Hefferlaw Hill in a line with Bambro Castle, and the Megstone half its breadth open to the west of Farn Island.

A black buoy usually marks the west end of the Goldstone, but it is sometimes driven thence 250 yards to the S.W., where it generally holds on.

The reef called the *Stiel* extends half a mile S.E. by E. ½ E. from the Goldstone, and is partially visible at low ebbs. Its eastern end lies with the north side of the Heugh touching the south side of Lindisfarn Castle, and the Megstone well open of Sunderland Point.

St. Nicholas Rock lies at a quarter of a mile N.W. of the Goldstone. Over it is 15 feet of water, but the sea breaks on it heavily. Its marks are Kyloe church just open to the north of Holy Island Castle, and the east side of the Megstone just open to the west of Farn Island.

The Minscore is the northernmost of the sunken rocks off Holy Island, and has 9 feet over it at low water. It lies at three quarters of a mile from the shore of the island, with the Black Law W.S.W. ¾ W., just clear of the high water mark at Castle Point, and the ruins of the cathedral in a line with Wingate Gap.

The Outer Wingate, a small rock, on which the sea generally breaks, lies at a short distance to the S.E. of the Minscore. It has only 6 feet over it at low water. The marks for it are, St. Cuthbert's tower, on Farn Island, open at low water to the west of the Megstone, and the ruins of Holy Island cathedral in a line with the north end of Wingate Gap.

The *Wingate* lies within a quarter of a mile to the S.S.W. ½ W. of the Minscore, and is visible at extraordinary low spring ebbs. The Plough beacon, next described, bears from it W. by S. one quarter of a mile.

The Plough Rock, about half a mile E.S.E. ½ E. from Lindisfarn Castle, uncovers at half ebb, and shows about seven feet in height at low water. Should the sea be sufficiently smooth, observe when its surface is exactly level with the top of the rock, for then there will be 15 feet of water over Holy Island Bar, in the line of the leading marks.

The part of the rock that dries is 40 yards long, and on its extremity is a black wooden beacon, the top reaching only 2 feet above high water. Its marks are, the beacon on the Heugh just open to the north of Lindisfarn Castle, and the hollow to the west of Kettlebottom Hill on with the east end of the granary at Warnham Flats. Close to the westward of this rock are 3½ fathoms of water, deepening to 4¼ fathoms in mid-channel, but shoaling toward the castle point.

The Plough Seat is a narrow reef extending from the Plough Rock one-third of a mile E.S.E. ¾ E. Its rocky heads are partly visible at low tides. The eastern end lies with the beacon on the Heugh just open to the northward of Lindisfarn Castle and Hebbron Hill in a line with the highest house at Ross. A *red buoy* generally lies off this end, but in severe gales it is sometimes driven a cable's length to the southwestward.

SAILING DIRECTIONS.

FARN ISLAND CHANNEL, or FAIRWAY.—In proceeding from the southward toward Holy Island, the common channel, for ships along shore, is that between Farn Island and the main. There are, in the fairway, south of the island, 14 fathoms of water, shoaling to 10 fathoms. In going through this passage, bring the south end of Hallidown Hill open to the westward of Holy Island Castle, or between the Castle and Look-out Hill of Holy Island. This mark may be kept on until the Brownsman appears open to the northward of the Megstone, when you will be clear of the Swadman, which is distinguished, as already noticed, by a black buoy.

If bound out to the northward, and not for Holy Island Harbour, you now haul to the eastward, until the lighthouses of Farn Island appear in a line over the Megstone, and this mark kept on leads clear between the Plough Seat and the Goldstone.

Should it happen, when you have passed the Megstone, that the wind shifts round to the northward or N.W., you may safely stand out to the eastward, only taking care to avoid Gussard's Seat, by running out with Kyloe trees, bearing W.N.W., open to the south of the Old Law, until the whole of Farn Island is seen without the east side of the Megstone; or, until the upper lighthouse bears S. ½ E. The Megstone in a line with Sunderland Point, leads clear on the eastward of the Stiel and Goldstone.

In turning between Farn Island and the main, approach no nearer to the Iselstone on the west than so as to bring the south end of Hallidown Hill nearly on with the Look-out Hill of Holy Island, and stand no nearer to the Swadman than so as to bring the south end of the same hill on with the castle. The turning-mark between the Plough-Seat and the Goldstone is, the Megstone from side to side of Farn Island. The leading-mark is, the Farn Lights in one, as already noticed.

SKATE ROAD.—The only place of anchorage within the Farn Islands is that called Skate Road, between Warnham Bar and that of Holy Island. With the south end of Hallidown Hill on with, or a little open south of, the Look-out Heugh, are from 5 to 7 fathoms, clean sandy ground; but without this mark the ground is rocky.

To Sail between the *Plough and Holy Island,* the mark is, the east end of the Granary on the south side of Warnham Flats, nearly S. by W., on the west end of Kettlebottom Hill. This mark leads a little without the bar of Holy Island Harbour.

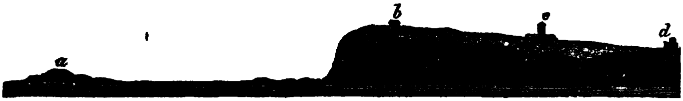
The Bar *of* Holy Island lies at the distance of a mile from the town. Its depth at low-water, spring-tides, is only 8 feet, and 12 or 13 feet at low-water with neaps, but 4 fathoms at high-water. On each side, within, is a ledge of stones or rocks. That on the N.E. being the rocky reef, called the *Stone Ridge,* which stretches along the N.E. side of the harbour. This ridge is covered at high-water of spring-tides only, excepting that part next the harbour.

At the other side is the small rocky flat, called the *Bat,* of only 2 or 3 feet at low water, which lies with Kyloe or St. Nicholas' Church on with the Laws; and, from the shore, stretching toward the Bat, is the *Parton-stiel,* a rocky reef, nearly dry at low-water, which is steep-to, and shows itself at the last quarter-ebb. Between the Bat and Parton-stiel is a narrow channel, called the *Tours,* of 4 feet at low water. The leading-mark through this channel is, Holy Island Church-belfry on with a small ridge in the brae, a little to the north of the beacon.

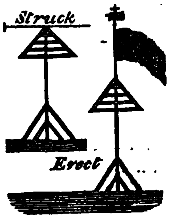
The channel within the bar winds to the northward, and becomes narrower and deeper to abreast of the inner part of the Stone-Ridge, where it is only two ships' length in breadth, but has a depth of 4 fathoms at low water.

To Sail into Holy-Island Harbour, bring the two pyramidal beacons which stand upon the Old Law into one, bearing W. by N., which will lead over the bar, until the beacon upon the Heugh, bearing N.N.W., and the Church-belfry, come on: keeping them so, will lead up to the anchorage before the town, in 3½ fathoms at low water.

Mark for running into Holy Island Harbour, after crossing the Bar,—the Beacon on the Heugh and Church belfry in one, bearing N.N.W.



a, St. Cuthbert's Isle.—b, Look-out House.—c, The Belfry and Beacon.—d, Ruins.



When the weather is rough, and pilots cannot get off, the flag-staff of the beacon upon the Heugh will be struck across, as shown by the annexed figure, until the proper time of tide for ships to enter; when it will be raised erect and a blue flag hoisted.

In sailing in toward Holy Island, particular attention must be paid to the tides, which will be found described under the proper head hereafter.

As there are 4 fathoms at high water, spring-tides, upon the bar, you need not then, in running in, if you have a scant wind from the westward, run so far to leeward as to bring the beacons on the Law in one; as, by keeping the church a sail's breadth open to the eastward of the beacon on the Heugh, it will lead you over the edge of the Parton Stiel, where it does not dry at low water, spring-ebbs. Your draught of water must be attended to. You will have very regular sounding from the main. Here you may depend upon a pilot, if it be possible for a coble to pull out to sea."

DANGERS northward of Holy Island.—*To the northward of Emanuel-head* are several dangerous reefs, over which, during gales, the sea breaks violently.

Those at a distance from shore, are the *Park-dyke*, the *Tours Reef*, the *Bean-stack*, *Wingate-Reef*, and *Spittal-hirst*, of which the following is a description:

The Park-dyke is the outermost; this shoal lies at two miles to the northward of Emanuel Head, and has, on its shoalest part, only 9 feet of water, close to which are 5 fathoms. The eastern end bears N. ¼ W. from Emanuel Head, and lies with Bambro church half way between the pyramid and low water mark of Emanuel Head; Lindisfarn Castle just open to the eastward of False Emanuel Head; and Berrington new hall just clear to the south of Goswick new hall. It thence extends W. by N. half a mile, and is about a cable's length in breadth.

The Tours Reef, at a short distance to the northward of the Park-dyke, lies parallel thereto, and has nearly the same extent, with two fathoms on its shoalest part, and 4¼ close to its edge. The eastern end lies with Bambro' castle just open eastward of the pyramid on Emanuel Head, and Berrington old hall in a line with the stackyard wall at Goswick.

Wingate Reef, lying to the westward of the Park-dyke, has, on its shoalest part, only 9 feet of water. Its eastern extremity bears from the pyramid on Emanuel Head N. by W. ¾ W. 2¼ miles, and it lies with Berrington new hall clear to the north of Goswick new hall, and the high lighthouse on Farn Island a little open to the eastward of the pyramid on Emanuel Head. The shoal extends W.S.W. ½ W. nearly a mile; and, from its western end the signal house at Budle appears in a line with the west end of the Heugh of Holy Island. The low water mark from shore now extends so near to the reef that no vessel should venture between.

The Bean-stack is a rocky shoal, of 9 feet, which lies at half of a mile W.N.W. from the Tours, nearly parallel to, and at a short distance from, the north side of Wingate Reef. From the pyramid on Emanuel Head the eastern end bears N.N.W. ¼ W. 2¾ miles; and from this end Holy Island castle appears in a line with the centre of the banks near Snipe Point. The west end lies with the signal house on Budle Hill just open to the eastward of the belfry on Holy Island, and Wingate gap in a line with the southernmost house at Beil. A large tract of foul ground, called the *North Beanstack*, lies to the northwestward of the Beanstack, its east end being about a quarter of a mile from it; the extent is above half a mile W. by N. and least depth 5 fathoms. Kyloe church seen to the northward of Biel trees leads over it.

Another patch of foul ground, a little farther to the northward, is called the Northern Tours. Its shoalest spot is 6 fathoms, at the eastern end, the marks for which are Kyloe church in a line with Biel engine chimney, and the signal house on Budle hill in a line with Holy Island castle.

The Inner Hirst, a rocky patch, over which there are 6 fathoms at low water, bears from Berwick lighthouse S.E. ¼ E. four miles. The marks for it are the N.W. plantation at Low Lin in a line with the largest house at Goswick, and the west part of Bambro' castle in a line with the west part of Coves on Holy Island.

The Spittal Hirst is another rocky shoal which lies at N. ¼ W. five miles from Emanuel Head, and S.E. by E. ½ E. 4½ miles from the lighthouse on Berwick pier. It is about two cables' long, from S.E. to N.W., and has 5 fathoms over it, but in strong gales the sea breaks over it; as may be seen both from Holy Island and Berwick. Its marks are, the easternmost part of Bambro' castle in a line with the pyramid on Emanuel Head, and a remarkable round clump of bushes at a considerable distance inland in a line with Cheswick. Around the shoal are from 8 to 10 fathoms of water.

SHOALS near Berwick. Three rocky spots, of only 14 feet, south of the entrance of the Tweed, are called the *Inner Busses*. They lie with the Magdalen field house in a line with Berwick lighthouse, at half a mile from the latter; and the Fishing Sheil on Spittal beach in a line with the south end of Roxbro' House.

Northward of Berwick lighthouse lie the *Coily Skars* and *Seal Carr*, which are merely detached from the mass of rocks stretching along shore from Berwick lighthouse. The two northernmost of the Scremerston windmills kept in a line, bearing S.W. ½ W., leads clear of them and another reef on the East.

DIRECTIONS FOR PROCEEDING TO BERWICK.

In standing to the northward from Emanuel Head, vessels must keep Bambro' castle open of that head, in order to avoid the dangers above described; but when St. Nicolas' or Kyloe church comes open to the northward of the town of Biel, they may stand boldly in to the shore toward Berwick.

From Emanuel Head the direct bearing and distance to Berwick are N.W. by N. 8½ miles, but the course must be shaped as above mentioned.

Berwick pier may be approached on any bearing between N.W. ½ W. and W.S.W. until within the distance of a mile, when it must be brought N.W. by W. ¾ W. in order to avoid the Walls End on the north, and the Inner Busses on the south, side of the entrance. The roadstead without has clean sandy ground, with the water deepening by degrees, from 6 and 7 fathoms to 12 and 13 fathoms; the latter depth being at a mile from shore.

When working to windward in the outer part of Berwick Bay during daylight, vessels should not stretch farther inshore than to bring the signal house on Budle Hill in a line with the pyramid on Emanuel Head, bearing S. ¾ W., as this general mark leads clear of the Tours, Park-dyke, and other shoals in the Bay. In the night the high light on Farn Island must not be allowed to come to the eastward of south, and therefore still open to the eastward of the low light.

Vessels which have not made the land should never attempt to run for Berwick Harbour in thick weather, but should keep at sea in not less than 35 fathoms; and, when they have made a good landfall and reached the vicinity of the harbour, they should not go into less than 18 fathoms till the proper time of tide for admittance. This is indicated at night by the *red tide-light* when there is a depth of 10 feet or more on the Bar. A pilot should be considered as indispensible; for heavy freshes down the river, when opposed by strong easterly gales, materially change the position of the sands at the entrance; and with or without a pilot the lead must be particularly attended to.

In approaching the harbour from the northward, the two northern Scremerston windmills kept in a line, S.S.W. ⅓ W., lead clear of all the rocks to the north of the pier, till the harbour's mouth is open, and the lighthouse bears N.W. by W. ¾ W. Observe that, in running from the northward during the night, a light at Berwick Hill colliery is sometimes perceptible, and some caution is therefore necessary not to mistake it for the pier light. The lighthouse on the pier, when the entrance of the harbour is to be attempted, must be brought to bear N.W. by W. ¾ W. and the time and set of the tide must be previously considered.

The sands at the mouth of the Tweed shift so frequently that the pilots are obliged to examine and sound the entrance after every gale; but, in general, Tweedmouth church kept in a line over the centre of a red tiled house situate directly to the eastward of the chancel window, bearing N.W. by W. ¾ W. will lead over the Bar and abreast of the lighthouse at the distance of about one-third of a cable.

Leading mark into Berwick Harbour; the house on the beach (c) and Tweedmouth church in one, bearing N.W. by W. ¾ W.

a, Spital Point flagstaff.—b, Foundery.—c, Tweedmouth church and the house.—d, Berwick light-house.

When over the Bar the course will be parallel with the pier as far as its inner elbow, but avoiding the *Crab Water Rock,* which is cleared to the west by keeping Berwick spire just open to the west of the King's bastion, near the flagstaff. The vessel must then steer to the S.W. till abreast the preventive staff on Spittal Point, when a course may be shaped along the beach on the western side, so as to round its curve till near the Carr Rock, where the best anchorage will be found.

In approaching Berwick from the southward, Budle Hill signal house must not be in with Emanuel Head until Berwick lighthouse bears N.W. by W. ½ W., in order to avoid the outer shoals: then steer for the light until within two miles, but approach no nearer than 8 fathoms without the aid of a pilot.

Any wind on the shore makes a great rolling sea here, and the ebb runs out with such a current, especially after rains, that there is no setting head against it, without hazard.

On advancing toward Berwick during the night, the light on the Longstone *(revolving)* ought not to be brought to the eastward of S.S.E., nor the Farn high light to the eastward of South until Berwick light shall have been brought to bear N.W. ½ W.

The best marks for anchoring in the Bay are, Berwick steeple N.W. or N.W. by N., and Holy Island Castle S. by E. ½ E. or S.S.E. Here you will have 10 or 12 fathoms, with sandy ground. During westerly winds vessels may anchor in the offing till the tide serves for entering the Harbour in several other positions; as in the outer stopping place, in 8½ fathoms, sandy ground, at a mile from the lighthouse, with Berwick spire N.W. ½ N. in a line with the lighthouse.

TIDES ABOUT BERWICK AND HOLY ISLAND.

FROM St. Abb's Head the flood sets to the southward, past Eyemouth, toward Emanuel Head; and it continues to run, at the distance of about two miles from land, two hours after the time of high water on shore, and at the rate of from one mile to one mile and a half in the hour. At Emanuel Head its strength increases, and it sets along the coast of Holy Island, toward Bambrough Castle, at the rate of three knots with spring-tides. From the bar of Holy Island the flood sets strongly into the harbour; but, without, it sets toward Warnham. High water, on the full and change, in Holy Island Harbour, at 2 h. 30 m. Spring-tides rise 15, and neaps 10, feet. At Berwick, the time is 2½, and the rise from 14 to 8½ feet.

Although where the tides hereabout are not influenced by the configuration of the land, islands, &c., they run nearly parallel with the coast, yet they are very much affected, both in height and regularity, by the direction of the wind and severe gales in the offing.

The main stream of the flood-tide outside of the shoals in Berwick Bay sets S.S.E., and that of the ebb N.N.W., changing, however, in direction and velocity, at different times of tide; that is to say the flood varies from S. by E. to S.E., and the ebb from N.N.W. to N.W.; their rate being from one quarter to two miles an hour, and increasing in velocity as they near the shoals and islands. The fishermen assert that there is a great indraught into Berwick Bay after strong easterly gales.

At a few miles on the outside of all the shoals both the flood and ebb streams gain their direct courses about three hours after high and low water on the shore.

On the outside of the Knavestone the stream of flood runs S.E. by S. and the ebb N.N.E., varying, however, in direction and rate, according to the period of tide, from one quarter to 3½ knots; and close to the shoals increasing to 4 knots.

The *Knavestone* and *Whirl Rocks* force the tides out of their direct courses, forming whirls and strong ripplings, and in rough weather adding much to the violence of the sea. Still farther out the flood runs S.S.E. and the ebb N.N.W.

In the centre of Berwick Bay the direction of the flood stream varies from S.S.E. to S.E., and the ebb from N.N.W. to N.W.; the general course of the former being S.S.E., and that of the latter N.W. by N.; while the flood varies from one quarter to two knots, and the ebb from one quarter of a knot to one knot and a half.

GENERAL DIRECTIONS *for* SHIPS *passing the* FARN ISLANDS, *&c. from the* SOUTHWARD *and* NORTHWARD; *chiefly from those published by the Hon. Corporation of Trinity-House, in March,* 1827, *on the Establishment and Improvement of the New Lights.*

A consideration of the dangers around the Farn Islands induced the board of Trinity-House, in 1810, to cause the lights to be altered and improved; and notice was accordingly given, that, from the 20th of January, 1810, they would be exhibited with an additional number of lamps and reflectors, producing lights of increased brilliancy: and, at the same time, that a small third light would be erected to serve as a leading-mark between the main land and islands: this was effected in the course of the year; and, in January, 1811, were issued at London, a general description of, and directions for, the same. An improved copy of this description and directions, caused by an alteration in one of the lighthouses, in 1827, is as follows:

DESCRIPTION *of the* LIGHT-HOUSES.

The light-house on the *Farn* is situated near the S.W. point of the island, about 60 to 100 feet from the cliff, which is 50 feet above the sea, and steep-to. The light in the tower is about 75 feet above the level of high water, spring-tides.

The other principal light-house is built on the *Longstone*,* one of the outermost of the Staple Islands, and nearest to the Knavestone, which is about 900 yards, or half a mile, E.N.E. from it. The tower stands about 200 yards W.S.W. from the water's edge, and the light in the tower is about 80 feet above the level of high-water mark, spring-tides. The lights revolve in both these towers, and show the full face of a reflector every half-minute; and they bear from each other W.S.W. and E.N.E. about 2¾ miles distant.

There is also a *third* or *low light* placed upon the *Farn Island*, for a leading direction through the Sound between the Goldstone and the Plough, near Holy Island; the distance between the said low light and the high light on the Farn, is 560 feet; and they bear from each other S. by E. and N. by W. leading nearer the Goldstone than the Plough, and directly over the Megstone, which rock is distant from the Farn about one mile. This light is seen only from a northerly direction, but the two principal lights are visible all round.

General Instructions for the Use of the Lead in passing the Islands, for Anchoring, &c.

In giving Directions for passing these dangerous islands and shoals, upon which there have been so many losses of lives and property, it is to be observed, that these losses have been principally occasioned by neglecting the necessary attention to the lead; the Corporation therefore earnestly recommend to all masters and pilots, when they approach these lights, bound either to the northward or to the southward, to keep the deep sea-lead going upon all that part of the coast, within the distance of *Cocquet Island* to the south, and *St. Abb's Head* to the north, from the islands; and if they find themselves in less than 30 fathoms, to haul out into that depth of water, which is the least that can be depended upon, to carry a vessel far enough to the eastward to be clear of all danger, and will bring them in sight of the lights; and when they are in one, bearing nearly W.S.W., which leads over the Knavestone, (the easternmost rock,) they may proceed either northward or southward, safe from the dangers of those shoals and islands. But all masters (and especially strangers to this navigation) are particularly cautioned not to attempt sailing amidst or within those islands or shoals; more particularly on account of the various settings of the rapid tide running in the different sounds between the islands, where, probably, very little space is to be found that is free from rocks and fit for anchorage. The only two roadsteads recommended, are: the one under the Farn, the light bearing N.N.W. distant about three cables' length, in 8 or 10 fathoms;—the other in Skate Road, off Warnham Flats;† the Farn light bearing S.E., and the Brownsman E.S.E., in about 7 or 8 fathoms.

If, in making these lights, bound to the northward or southward, and with the wind from the eastward, vessels cannot pass them in 30 fathoms, or upward, it is recommended to make a board, if it is practicable to work to windward, rather than pass through the Inner Sound; but, in case of hard gales, when there is danger of being forced upon the shore by tacking to keep the sea, and vessels cannot pass without the islands in 30 fathoms by night; or cannot, in the day-time, pass to the eastward of the breach on the Knavestone, (which is only dry at half-ebb,) the only resort, in such cases, will be to take the Sound.

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* In lieu of the former one on the *Brownsman*.—Ed.

† Captain Johnson, however, has observed that Skate Roads are so much exposed to the eastward that they cannot be recommended as a common or secure anchorage, but only as a stopping place during the westerly winds, or perhaps when ships can neither keep the sea, nor make Holy Island Harbour.

For Sailing through the SOUND *to the* NORTHWARD.

UNDER the foregoing circumstances, vessels bound to the northward, should steer for the Farn light, taking care to avoid the *Crumstone Rock*, (the southernmost of the Staple Islands,) from which the light on the Longstone bears about North, rather more than a mile, and the light on the Farn, about W. ½ N., distant about two miles; to sail clear of which, they must not bring the Farn light farther to the westward than W.N.W., and steer in to the westward until Farn high light bears N.W. (to avoid the *Scare Crows* and *Wide Opens*) when they may steer for the light, and pass the S.W. point of the Farn Island, at half a cable's distance, or less, it being steep-to.

When the gale is such as will allow masters of vessels to proceed to the northward; if they can make good a N.N.E. course, they may haul up, in order to pass through the Sound between the Megstone and Ox-Scar, (or South Goldstone,) and bring the high light as much to the eastward of the low light as their difference of height, (that is, the low as much to the westward of the high light, as it is lower than the high light,) which will take them about 170 yards to the eastward of the middle part, or about 100 yards to the eastward of the dry part, of the Megstone Rock, in about 6 fathoms. This rock is always 12 feet above water, and steep-to on the east and north sides; so that, at 4 or 5 fathoms distance from the dry rock on the N.E. side, there are 4 fathoms of water increasing to 6, and shoaling from 6 to 3 fathoms toward the reef, which extends about one-third across the Sound from the Ox-Scar toward the Megstone, and leaves the Sound only about 500 yards wide between those two rocks. In this passage, between the Farn and the Megstone, there is about 8 or 9 fathoms, and in the Sound, between the Megstone and Ox-Scar, about 6 fathoms, with the lights open as above described. After passing the Megstone, either in sight, or upon deepening again one or two fathoms, vessels may bring the lights in one, and proceed in this line; the soundings will vary from 9 to 7 fathoms, and near abreast of the Gussard's Seat, to 6 or 5½, deepening to 11. When they are abreast of the Goldstone, and in 12 fathoms, (at low water,) they are past all danger, and may then proceed, hauling out to the northward, and opening the high light to the eastward of the low light, till they come into 16 or 18 fathoms.

For Sailing within the LIGHTS, *or anchoring in the* ROADS, *if bound to the* NORTHWARD.

If commanders prefer going through the Inner Sound, having passed the high light on the Farn, they should bring it to bear S.E. ½ S., and keep it so, until they have the Longstone light E. ¾ S. to avoid the Swadman and the Reef which extends to the westward from the Megstone; and when they have those two lights on the above bearings, or they can see Bambrough Castle about S.W. by W., and can make good a N.N.E. course, they may haul to the eastward, and bring the high and low lights upon the Farn in one, and proceed in that line as before described; but, if they have any doubt of regaining this line, by either of those passages, it will be necessary to anchor; if the wind is E. by N. or more northerly—under the Farn Islands, the high light bearing N.N.W. distant about three cables' length, in 8 or 10 fathoms; if more easterly—proceed for Skate Road, off Warnham Flats, by steering N.W. from the high light on the Farn, and keeping it S.E. until the Longstone light bears E. by S. ¼ S., or Bambrough Castle bears S.W. by W. in 7 or 8 fathoms, where, if forced from their anchors, they stand the best chance of saving lives and property.

For Sailing within the LIGHTS *to the* SOUTHWARD.

WHEN in proceeding from the northward to the southward, after having passed St. Abb's Head, vessels are prevented by heavy gales from the eastward, from hauling into 30 fathoms of water, as in the foregoing supposition; and falling into 16 or 18 fathoms, with heavy gales upon a lee-shore, they are not able to get to the eastward (the wind being at E. or E. by N.) they had better tack to the northward, and keep the Frith of Forth open, than attempt to proceed; but if, from the appearance of night, it is judged prudent to proceed, they ought not to come into less than 16 or 18 fathoms, to avoid the shoals, north of Holy Island, until they make the lights:—If then at a great distance, they may not see the low light; but keeping the high light on the Farn about S. ½ E., will take them to the eastward of the leading line, to avoid the above shoals; and, upon making the low light, if it be to the westward, they may edge off to the westward, until they have the two lights in one, as before described, which will take them between the Goldstone and the Plough, and they may thence proceed in that line, until they have the light on the Longstone S.E. by E. nearly, when, if they can haul to the eastward, so as to bring the high light as much to the eastward of the low light as their difference of height, (as before,) they may proceed in that direction of the lights, to pass to the eastward of the Megstone; and, from the Megstone, to steer so as to pass half a cable's length to the westward of the light on the Farn.

If, when the Longstone Light bears S.E. by E., vessels cannot haul up to the eastward, and find it advisable to anchor in Skate Road, steer for it S.W. ½ W. until they have the bearings of the lights, as before mentioned, in 7 or 8 fathoms: or, if they mean to proceed through the Sound, in that case, instead of steering S.W. ½ W., steer S.S.W. until they bring the high light on the Farn S.E. ½ S., which they may then steer for, and it will take them to the westward of the Swadman; and then passing half a cable's length to the westward of the Farn, they may safely proceed to the southward.

GENERAL CAUTION.—These Directions are given, supposing it to be night-time, and stormy weather, but they may be useful in the day-time also: however, it cannot be too earnestly impressed on the minds of all who have charge of vessels passing this intricate navigation, (except the constant traders to and from Berwick,) not to involve themselves among these islands, either by day or night, whether with favorable or with contrary winds.

ACCOUNT of the SIGNALS made use of at BAMBRO' CASTLE, in case Ships or Vessels are perceived in Distress, and of the Institution established there for their Assistance and Relief; as published by the Trustees of Nathaniel, Lord Crewe, made Bishop of Durham, by Charles II.; with the Approbation of the Corporation of Trinity-House in Newcastle-upon-Tyne.

SIGNALS.—I. A gun (a nine-pounder) is placed at the bottom of the tower, to be fired as a signal, in case any ship or vessel be observed in distress, viz.

Once, when any ship or vessel is stranded or wrecked upon the islands, or any adjacent rock.

Twice, when any ship or vessel is stranded or wrecked behind the castle, or to the northward of it.

Thrice, when any ship or vessel is stranded or wrecked to the southward of the castle; in order that the custom-house officers, and the tenants with their servants, may hasten to give all possible assistance, as well as to prevent the wreck from being plundered.

II. In every great storm, two men on horseback are sent from the castle, to patrol along the coast, from sun-set to sun-rise, that, in case of an accident, one may remain by the ship, and the other return to alarm the castle. Whoever brings the first notice of any ship or vessel in distress, is entitled to a premium, in proportion to the distance from the castle; and, if between twelve o'clock at night and three o'clock in the morning, the premium to be double.

III. A large flag is hoisted when there is any ship or vessel seen in distress upon the Farn Islands, or Staples, that the sufferers may have the satisfaction of knowing that their distress is perceived from the shore, and that relief will be sent as soon as possible. In case of bad weather, the flag will be kept up, a gun fired morning and evening, and a rocket thrown up every night from the north turret, until such time as relief can be sent. There are also signals to the Holy Island fishermen, who, by the advantage of their situation, can put off for the islands at times when no boat from the main land can get over the breakers. Premiums are given to the first boats that put off for the islands, to give their assistance to ships or vessels in distress, and provisions and liquors are sent in the boats.

IV. A bell in the south turret will be rung out in every thick fog, as a signal to the fishing-boats; and a large swivel, fixed on the east turret, will be fired every fifteen minutes, as a signal to the ships without the islands.

V. A large weather-cock is fixed on the top of the flag-staff, for the use of the pilots.

VI. A large speaking-trumpet is provided, to be used when ships are in distress near the shore, or are run aground.

VII. An observatory, or watch-tower, is made on the east turret of the castle, where a person is to attend every morning, at day-break, during the winter-season, to look out if any ships be in distress.

VIII. Masters and commanders of ships in distress are desired to make such signals as are usually made by people in their melancholy situation.

ASSISTANCE, &c.—I. Rooms and beds are prepared for seamen, ship-wrecked, who will be maintained in the castle for a week, (or longer, according to circumstances,) and, during that time, be found with all manner of necessaries.

II. Cellars for wine and other liquors from shipwrecked vessels, in which they may be deposited for one year, in order to be claimed by the proper owners.

III. A store-house ready for the reception of wrecked goods, cables, rigging, and iron. A book is kept for entering all kinds of timber, and other wrecked goods, giving the marks and descriptions of each, with the date when they came on shore.

IV. Four pair of screws for raising ships that are stranded, in order to their being repaired.—Timber, blocks, and tackles, handspikes, cables, ropes, pumps, and iron, ready for the use of shipwrecked vessels.

N.B. But, if taken away, to be paid for at prime cost.

V. A pair of chains, with large rings and swivels, made on purpose for weighing ships, (of a thousand tons burthen,) that are sunk upon rocks, or in deep water.

N.B. These chains are to be lent (gratis) to any person having occasion for them, within 40 or 50 miles along the coast, on giving proper security to re-deliver them to the trustees.

VI. Two mooring-chains, of different lengths, are provided, which may occasionally be joined together, when a greater length is required.

VII. Whenever any dead bodies are cast on shore, coffins, &c., will be provided gratis, and also the funeral expenses paid.

⁂ A life-boat and Manby's mortar, under judicious regulations, are always kept in constant readiness, for the relief of vessels in distress.

TIDES BETWEEN SCARBOROUGH AND ST. ABB'S HEAD.

Upon the full and change days of the moon, the tide flows at Flamborough Head at six o'clock; and, at other places, as follows: at Scarboro', at a quarter past 4; Whitby, 40 minutes past 3: Mouth of the Tees and Hartlepool, half-past 3; and Sunderland, at 3 o'clock: at Tinmouth Bar, 50 minutes past 2;* Blyth, Coquet Island, and Holy Island Harbour, three-quarters past 2; Berwick and Eyemouth, a quarter past 2.

The perpendicular rise of tide, in feet, is nearly as follow: at Flamborough Head, spring-tides, 20, and neaps about 11, feet; at Scarborough, springs 13, neaps 8; Whitby, springs 15, neaps 10; Tees' Mouth, springs 16, neaps 10; Hartlepool, springs 18, neaps 10; Sunderland, springs 14, neaps 9; Tinmouth, springs 13, neaps 8; Blyth, springs 12, neaps 7; Coquet-island, springs 15, neaps 9½; Holy-island Harbour, springs 18, neaps 11; Berwick and Eyemouth, springs 16, neaps 10.

The stream runs to the southward, in the offing, three hours after high-water on shore. Gales of wind from between W.S.W. and N.W. are found to raise the tide higher, and cause the stream of flood to run some time longer in the offing. Easterly and S.E. winds have the contrary effect.

From St. Abb's Head, the flood sets to the southward past Eyemouth, toward Emanuel-head; and continues to run, at the distance of about two miles from land, two hours after the time of high-water on shore; and at the rate of from one mile to one mile and a half an hour. At Emanuel-head its strength increases, and it sets along the coast of Holy-island, toward Bambro' Castle, at the rate of 3 knots with spring-tides. From the bar of Holy-island, the flood sets strongly into the harbour; but, without, it sets toward Warnham. Between the Longstone and Emanuel-head, it sets for the inside of Farn-island: but, near the Longstone, for the passage between the Staples and Farn-islands, where it runs with great rapidity. Vessels passing should attend to this, that they may not be drawn in with it, in a calm.

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* At Shields and Sunderland, it has been observed, that a brisk north-westerly gale brings the tides on sooner, and causes them to rise as many inches higher, as the usual rise in feet. On the contrary, a strong south-westerly breeze retards the motion of the current, keeps the tide back later, and prevents its rising so high, in the same proportion. A strong north-easterly wind brings the tides on a little sooner, and causes them to rise something higher than usual; but not nearly so much as a north-westerly wind. So, also, a brisk south-easterly wind keeps the tides back a little later, and prevents their rising so high as usual, but not nearly so much as a south-westerly wind.

The harbours of Shields and Sunderland have high-water 15 minutes later than their bars at spring-tides, and about half an hour later with neap.

Within the Megstone, between it and the main, the flood sets parallel to the shore; increasing in strength until between the Iselstone and Farn-island, where spring-tides run nearly five miles an hour; and, with southerly or S.E. winds, raise a frightful sea, appearing like breakers.

The following is Captain Johnson's description of the tides about the Farn-islands.—On the full and change days of the moon, it is high water at forty minutes past two o'clock, at Farn-island. The perpendicular rise of the water is sixteen feet and a half, at high water spring-tides, and nine feet at neap-tides. Both the flood and the ebb-tides run two hours and a half, in the passages, after it is high and low water on the shore. The time of slack water is very inconsiderable.

The main body of water in flood-tides sets from Emanuel Head for the inside of Farn Island; but, when nearer the Longstone, toward the passage between the Staples and Farn. The streams of both the flood and ebb-tides are, necessarily, forced out of their respective courses, on their approach to the islands, by some of the causes before alluded to; and thereby accelerated or retarded accordingly, which will be fully explained.

The flood-tide, when it approaches the islands, is separated by the north point of the Wamses, part of the water being forced to the westward into the passage between the Farn and Staples, and also into the opening between the Farn and Wide-opens; and that part of the water which is not influenced by those openings, runs in a S.W. direction between the Megstone and the N.W. point of Farn Island, which point forces the water toward the main land, forming a curve, which sometimes extends half-way between the main and the Farn, but necessarily increases or diminishes according to the velocity of the water, which is affected by spring and neap tides, gales of wind in a particular direction, &c. &c.

The Iselstone Rocks interrupt the course of the in-shore tide, and forces the water a little to the eastward, where spring-tides run five miles per hour.

The other, or outer part of the flood-stream, is forced to the eastward, from the north point of the Wamses running through the openings* between the rocky islands situated between the Wamses and Longstone; but the water that does not go through these openings, sets eastward, until it passes the north point of the Longstone, when, being joined by the main tide, it rushes with great rapidity through between the Longstone and Knavestone, and glides again into its southerly course.

The whole of the flood-stream appears to join, and resume its coastwise direction, when abreast of Sunderland Point; thereby recovering from the interruption it received by the Farn Islands.

Between the two passages, *i. e.* between the S.W. point of Farn Island and the Scare-Crows, there is an eddy during the flood, where, in contrary winds, vessels may turn or anchor, (for marks, see page 87,) until the tide changes: there is, however, about an hour after the flood has made, a stream, running with considerable rapidity, in the opening between Farn and the Wide-Opens, which, when turning, must be attended to.

There is necessarily an eddy, more or less, on the south side of all these islands, during the flood, and on their north sides during the ebb-tide. The two most considerable are the before mentioned, and that between the S.W. point of Staples Island and the S.E. point of Longstone; but, about an hour after the flood has made, streams of considerable force come through the openings between the rocky islands described in page 85, which openings are covered at about that time.

Wherever there is an eddy, it causes a rippling, appearing like the disturbed or broken water on shoals. When the wind is in a contrary direction to the tide, it is very conspicuous all round the islands: and on the south side of Farn Island, on the edge of the first-mentioned eddy, in south-east gales, the sea breaks with great violence.

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* Most of these openings dry at five hours' ebb.

The EBB-TIDE.—The in-shore part of this tide sets from Sunderland Point, for the passage or inner part of the Farn Island; and the outer part parallel to it, toward the passage between Farn and Staples. When it approaches the islands, it is separated by the south point of the Wide-Opens, part running into the passage between the Farn and Staples, and also between the Farn and Wide-Opens; the other part gliding toward the S.W. point of Farn Island, where it forms a small curve to the westward, but winds again into the passage between the Farn and Megstone, and then between Megstone and Oxcar; the in-shore part pursuing a coastwise direction, between Megstone and the main land.

The ebb is also divided at the point of Staples Island, near to the Pinnacles, part running into the passage between Farn and Staples, and the other part gliding in an easterly direction from the Pinnacles to the south point of Longstone, except where it partially runs through the openings before described; and, passing the south point of Longstone, it is joined by the main tide, and winds through between Longstone and Knavestone: and, close in to the first-mentioned, there is an eddy, caused by the rapidity of the water past its south point.

SECTION VIII.

ST. ABB'S HEAD *to* BUCHANNESS; *including the* FRITH *of* FORTH *to* LEITH, *&c.*

ST. ABB'S HEAD *to* FIFENESS, *including the* FRITH *of* FORTH.

DESCRIPTION.—ST. ABB'S HEAD, which is so named from a little chapel near the point, is a high and remarkable promontory. The shore around is steep, rocky, and cliffy; and there is deep water, 30 and 40 fathoms, not far from land. The tide runs by it with a strong current; but a little wind makes a great rolling sea. This Head lies in latitude 55° 55½′, and longitude 2° 8′ west of Greenwich.

N.W. 3 miles from St. Abb's Head, upon a rugged point, is *Fal's Castle*, in ruins, upon the point of a rocky promontory: and a league hence, in the bottom of a long bay, is a place called the *Coves*. The shore here is high, rocky, rugged, and foul, a good way out; but, without, are 20 and 24 fathoms at a mile from land: at this distance from the Cove there are 16 fathoms, decreasing to 6 or 7 fathoms. In some seasons, the herrings in this place swarm very thickly.

DUNBAR.—The course and distance from St. Abb's Head to Dunbar are N.W. ½ N. 14 miles. The coast between is generally foul and rocky. The harbour of Dunbar is a pier-haven, situated within a low rocky point. The bottom is of solid rock.* Off the harbour, nearly a mile from shore, you may anchor, with off-shore winds, in 7 or 8 fathoms, with bottom of clean sand; but the common roadstead is directly off the harbour, in 10 or 12 fathoms, sandy ground. Some rocks, called the *Staples*, a part of which are always above water, with deep water close-to, lie off the west side of the harbour. This place is famous for herrings.

The entrance to the harbour is very narrow, and any wind in causes a great rolling sea, which, making a short turn, and a run in the strait, where there is no room for a ship to work, may happen to dash her against one of the sides; so that the attempt is difficult, unless in easy weather.

Two miles and a half N.W. of Dunbar lies Whitberryness, a low downy point, with a Knab on it, frequently called St. Baldrin's-boat or Cradle. Between is a deep sandy bay, called Tyningham-flats, which forms the entrance of a river of the same name. To some distance from the mouth of the bay the water is shoal, and must therefore have a proper offing.

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* The harbour of Dunbar is small and difficult of access, but it has kays and a dry dock, and is defended by a battery of heavy ordnance. Ship and boat building, rope-making, &c., are carried on here; and there are iron founderies, spinning mills, cotton and soap manufactories, &c.

The BASS.—The well-known rock, called the Bass, on the south side of the mouth of the Frith of Forth, lies N.W. by N. 20 miles from St. Abb's Head, and 6 miles N.N.W. from Dunbar. It is three-quarters of a mile in circumference, very high and steep on all sides, especially toward the sea; the cliffs are whitish, being almost covered with the dung of sea-fowls, that build there. The depth, close to its base, is 15 or 16 fathoms, and there are 25 fathoms at a mile out. Between it and the shore is a clear passage of 14 or 15 fathoms, but the ground is generally foul. The islet is of a round form, but rugged, and slopes from the top. Its height is about 400 feet above the level of the sea, and its cliffs are accessible by only one narrow passage, which faces the main land. Close by the landing place are the ruins of an antient castle, once a place of great strength. The isle is private property, now uninhabited, and frequented by immense flocks of solan geese, from the end of February to the middle of October. Some sheep find pasture on the summit.*

Two miles to the N.N.W. of Whitberryness is the point of Scougal. The bay between is sandy. A mile and a quarter to the N.W. from Scougal-point is Tamtallan, a large old castle, or fort, in ruins, on the edge of the shore. On the west of this is the village called *Castletown.* The coast here is steep, rocky, and foul. The *South Carr*, a reef of rocks, stretches half a mile out N.E. from Scougal-point. It lies N.N.W. ½ W. 4 miles from Dunbar, and a mile east from Tamtallan, mostly dry at low water. The outer part is steep, with 7 fathoms, close-to. With N.E. winds, many vessels have been wrecked upon these rocks, which has probably been, in some measure, owing to a strong indraught, setting, with the flood, into Tyningham-flats.

W.N.W. of the Carr, within the Bass, to North Berwick, the shore is foul and rocky to the distance outward of a cable's length; and, in some parts, more.

At a mile in-land from the town of *North Berwick* is a remarkable round hill, called *North Berwick Law;* and, half a mile to the westward of the town, are several rocks; some of them above water. N.W. by W. ½ W. 2½ miles from the Bass, and a little more than a mile from shore, is a round island or rock, steep on all sides, and named *Craig Leith.* Between this rock and the rocks half a mile from North Berwick, is a clear passage.

A mile west from, and nearer the shore than, Craig Leith, is another islet, called *Lamb-isle,* or the *Balladen,* with much foul ground about it, especially toward the coast. Nearly two miles W.N.W. from Craig Leith, and N.W. a mile from Lamb-isle, is a high black rugged rock, of a singular form, called *Fidra,* with foul ground about it; and, between it and the shore, is a long reef, called the *Bridge,* which prevents the passage, even of boats. Nearly a mile west of Fidra, and one quarter of a mile from shore, is a long low rock, called *Ibris,* nearly covered at flood, but dry at low water.

Near the outside of the rocks, above mentioned, there are 20 fathoms of water.

MAY-ISLAND.—Seven miles N.E. ¼ E. from the Bass, 10 miles N. by E. ½ E. from Dunbar, and 22 miles N. by W. ½ W. from St. Abb's Head, lies the small island called May-island. This isle is steep all round, excepting the north point, which is shoal to the distance of half a cable's length at low water. Between the Bass and this island there are 26 and 28 fathoms; and, between the isle and the shore of Fife, 22 and 24 fathoms. The point of Fifeness lies N. by E. ½ E. 4½ miles from the island.

May-island was formerly distinguished by a lighthouse, originally established in 1635. The old light consisted of a large chaffer of coals, placed on the top of the tower, lighted every night, consuming a great quantity of coals, and subject to great variations, according to the state of the wind. In December, 1810, the Pallas and Nymphe frigates, deceived by a glowing lime-kiln on the coast, near Dunbar, which they mistook for the May-light, were both lost. Some time after a treaty was entered into for the purchase of the property, which was followed by the passing of an Act of Parliament, under which, the light and island were bought from the Duke of Portland, and vested in the Commissioners for Northern Lights, by whose directions a new lighthouse has been constructed; and, from the 1st of February, 1816, a light from oil, with reflectors, known to mariners as a brilliant fixed light, has been exhibited throughout the night.

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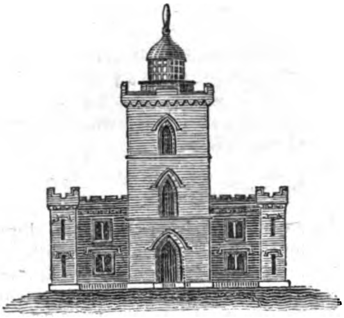
* For further particulars, see the Penny Magazine, No. 82, July 13, 1833.



The new lighthouse, represented in the margin, is contiguous to the old tower, and similar to it in point of height; and the light being defended from the weather, in a glased light room, has an uniform steady appearance, resembling a star of the first magnitude, and seen from all points of the compass, at the distance of about seven leagues; of course at all intermediate distances, according to the state of the atmosphere.

The lighthouse is on the summit of the isle, and built of stone. The building, from the base to the lantern, is 57 feet in height, but the elevation of the latter, above the sea at high water, spring tides, is 240 feet.

Between Ibris and Gullen-ness the shore is low and flat: but, beyond this point, in Aberlady-bay are regular soundings, from 7 to 10 fathoms, sandy ground.

INCH-KEITH.—*The isle called* Inch-Keith, which lies nearly in the middle of the Frith, between Leith and Kinghorn-ness, is three-quarters of a mile in length from N. by W. to S. by E. This island has a lighthouse upon it, which stands nearly in the middle of the island; and, on the highest part, near the north end, are the ruins of a fort. The east and north sides are steep-to, within two ships' length of the shore; but a black rock, always above water, off the N.W. point of the island, has a reef stretching two ships' length to the westward. The west side is also foul, and many of the rocks are seen at low water.

The lighthouse was first lighted on the 1st September, 1804, and continues to be lighted every night. The light is from oil, with reflectors, elevated above the level of the sea, at high water of spring-tides, 220 feet; of which height the building forms 45 feet.

The light, which was originally *stationary*, was afterward changed by order of the Commissioners of the Northern Lighthouses, for a *revolving* light without colour, seen from all points of the compass, exhibiting a bright light once in every minute, and gradually becoming less luminous, till, to a distant observer, it totally disappeared. In this manner, each periodic revolution of the reflector-frame alternately displayed a bright light, and a lighter, becoming fainter and more obscure, until totally eclipsed.

But, from the month of October, 1835, the light, as described above, has been discontinued, and a dioptric or refracting light substituted, as being more effective. The new apparatus consists of seven annular lenses, which circulate round a lamp of three concentric wicks, and produce bright flashes once in every minute; and of five rows of curved mirrors, which, being fixed, serve to prolong the duration of the flashes from the lenses. The appearance of the new light does not therefore materially differ from that of the former one, excepting that the flashes, which recur at the same periods, are considerably more brilliant and of shorter duration. In clear weather the light is not totally eclipsed between the flashes, at a distance of four or five miles.

Off the south end of Inch-keith, separated by a narrow rocky channel, through which the tide flows, lies the *Long-craig*, a narrow black rock, which is always above water.—S. by E. ½ E. half a mile from the Long-craig, are the *Brigs*, a reef appearing only at spring-ebbs. They are separated from the former by a narrow channel of only 10 or 12 feet at low water. The *Herwit*, another reef, which shows at spring ebbs, stretches S.E. by S. half a mile from the Brigs, and S.S.E. 1 mile from the Long-craig; having between it and the Brigs a small channel of 3 fathoms. The south part of the Herwit is distinguished by a black buoy, which marks the boundary of the channel to Leith, between this danger and that which is next described. The buoy is one mile and a quarter S. by E. ¼ E. from Inch-Keith lighthouse, in 6 feet at low water, spring-tide.

The **North Craig** is nearly in the middle of the passage called the South Channel of Leith. On its shoalest part are only 12 feet at low spring-tides. The reef consists of craggy rocks, and is about a cable's length in extent from East to West, and not quite so much from North to South. Its north side is distinguished by a coppered buoy, with a mast upon it, painted and chequered red and white. It lies at 2½ miles S.E. ¾ S. from Inch-Keith lighthouse, in 19 feet at low water.

The marks for these rocks are, the west brow of Donairn-hill on with the N.E. point of Inch Keith, bearing N.W. ¾ N.; Inch Keith lighthouse N.W. ¼ N. distance 2¾ miles; Lord Nelson's monument, on Calton Hill, on with the west end of the easternmost house on the beach, east of the Glass-houses, W.S.W. ¼ W.; the black buoy of the Herwit, N.W. by W. ¼ W. and the red buoy on the Waff Craig, next described, S.W.*

The **Waff-craig**, or *Craig-waugh*, is a small round rock, about a ship's length over, the weeds on which may be seen at low spring-ebbs. This rock lies S.S.E. ½ E. one mile and a half from the black-buoy on the Herwit, and 2 miles, in the same direction, from the Long-craig. It has a red buoy on its north side, at 2¾ miles S. by E. ¼ E. from Inch Keith lighthouse, in 3 feet at low water.

The **Gunnet**, *&c.*—Westward of Inch Keith, at the distance of one mile from the north end of that island, are two rocks, conjointly called the *Gunnet*. They extend about half a cable's length E.S.E. and W.N.W., and have 9 or 10 feet on them at low water; each end is distinguished by a *white buoy*, lying about a mile and a half W. ½ N. from Inch Keith lighthouse, in 8 feet at low water.

Pallas Rock.—Between the Gunnet and Inch Keith there is a small rock, about 70 feet in circumference, and having only 10 feet over it at low spring tides. His Majesty's ship Pallas struck on it in 1810; hence it has been called the **Pallas Rock**, not having been previously known. This rock lies with the Gunnet and Mickry Stone in one, bearing W. by N. ½ N.; Petty-cur pier-head on, or rather open to the eastward of, a remarkable hedge, which stands in a North and South direction, bearing North; and Inch Keith lighthouse E. by N. half a mile. Its situation is now distinguished by a buoy, painted with black and white stripes, and lying at three quarters of a mile W. by S. from Inch Keith lighthouse, in 10½ feet at low water.†

About four miles to the westward of the Gunnet are several isles and rocks, not heretofore described. Of these the principal, on the north side, is that called *Inch-colm*, which is a narrow island W. ½ N. 4½ miles from Kinghorn-ness, and 5 miles W.N.W. ½ W. from the north end of Inch-keith. To the N.E. and northward of it are numerous rocks; particularly a large one called the *Car-craig*, a high round rock, which lies about a quarter of a mile E.N.E. from Inch-colm, and is steep-to on its south and eastern sides. To the N.W. of Inch-keith there is, also, another high round rock, called the *Hay-stack;* and there are, to the westward, several other rocks, which will be found noticed hereafter in the Sailing Directions.

Oxscars, &c.—S.E. three-quarters of a mile from Inch-colm, lie the Oxscars, some rocks which appear at four hours ebb, and lying just in the way of ships passing up or down the Frith. The north side of them is distinguished by a beacon. Upon this side there are 12, and upon the west side 8, fathoms. In the channel between them and Inch-colm are 22 fathoms. A narrow bank, of 3½ and 4 fathoms, extends a mile and three-quarters E. by S. from the beacon.

The *Mikry-stone*, a high black rock, with some smaller rocks, lie half a mile south from the Oxscars; and *Mikry*, a rocky islet, lies half a mile south of the Mikry-stone: between

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[*] Our information, with respect to this reef, and the Pallas Rock, is derived from a letter addressed to Rear-Admiral Otway, by Captain M. Buckle, commander of his Majesty's ship Adamant, in 1810. Beside the marks given above, other marks are, the northernmost lump of the Pentland Hills on with the south saddle of Arthur's Seat, S.W. ¾ W.; Leith Church spire just open to the eastward of the second westernmost glass-house, W. by S.; a square tower on the top of a hill on the north shore on with a farm-house one field up from the cliff, bearing North; and East Lomond Hill on the east end of four remarkable trees, bearing N. by E.

[†] Other marks taken by Captain Buckle are, a square tower on a hill just open to the eastward of the West Lomond Hill, bearing N. ½ E.; and the spire of St. Andrew's Church at New Edinburgh on with the east end of Edinburgh Castle, S.W. ½ W.

is a depth of 2 fathoms. A small green island, called *Cramond Island*, lies S.W. by W. one mile from Mikry. Between are 3, 4, and 5, fathoms.

LEITH.—On Leith-sands, a little to the eastward of the pier, lie the rocks called *Leith-craigs*, which appear at half-ebb; and near the outer end of Leith-sands, N. by E. three-quarters of a mile from, and right off, the pier-head, and N.W. from Leith-craigs, are the rocks called the *Beacon-rocks*, from a beacon which stands upon them. These rocks appear at two-thirds ebb. The tide here ebbs out to a mile from shore, but the outer edge of the bank is very steep. From its point, directly off the Craigs, is a reef called the *Symons*, with only 3 or 4 feet over it at low water, and extending to the distance of two ships' length. The roads of Leith lie to the westward, and are protected by a martello tower on the edge of the bank to the East.

There are two lights on the Eastern pier of Leith, at 1500 feet S. ½ W. and N. ½ E. from each other. The old one, *brilliant*, is 10 feet above the sea at high water. The new one, *red*, has, from December, 1829, been exhibited on the extreme point of the pier. Masters and pilots entering the harbour will keep the red light its own breadth or diameter open to the eastward or left of the Old Pier light, when they will be in mid-channel and close to the present white or fair-way buoy.

The lights are kept up while there are nine feet of water on the bar. In the day-time signals are displayed, in relation to the rise of tide, commencing with one ball at the top of the flag-staff where there is a depth of 9 feet on the bar.

At NEWHAVEN, three-quarters of a mile westward of Leith, a small fixed light, of a *red* colour, is exhibited on the pier, but only when the passage boats ply in the night. It may be seen between two and three miles off.

NORTH SIDE of the **FRITH.**—The point called *Kinghorn-ness* lies N.N.W. ½ N. about two miles and a quarter from Inch-keith. Between are 20 and 22 fathoms. The shore is steep and rocky. To the westward of this point is the little harbour and pier called *Petty-cur*, and at two miles W. by N. from Kinghorn-ness is *Burnt Island*. Along the bay between, is a bank, stretching to the southward, with its greater part dry at low water, although 10 or 12 fathoms are close to it. Between it and the Gunnet are 18 and 20 fathoms, and there is the same depth all the way up to Inch-colm and the Oxscars.

The shore at Burnt-island, and thence for a mile to Stanleyburn, is steep. Stanleyburn is an excellent watering-place, with a small pier. The road of Burnt-island lies between the pier and that of Stanleyburn, and has from 5 fathoms toward the shore to 13 and 14 fathoms a mile out, clayey ground, regularly deepening.

A reef of rocks, called the *Commons*, stretch half a mile from shore at the west side of Stanleyburn, and must be carefully avoided.

BURNT-ISLAND HARBOUR.—This is the best harbour in the Frith of Forth, but it has very little trade, except fishing: yet it is a good place for vessels to lie in when bound to the southward, as they can get down hence, when they cannot proceed from Leith Roads, with the wind from the northward. You have no danger to fear when running in, but that of hitting the piers. Run in the middle between them, and have an anchor ready to let go. When in, you will lie upon a good bottom of sand, and dry at low water.

By keeping the piers open, you will avoid the rocks which lie to the eastward of the harbour.

At Burnt Island a small bright light, at 20 feet above the level of high water, is kept up during the night on the eastern or starboard side when entering the harbour, which may be seen at the distance of six or seven miles.

KINGHORN.—A lighthouse on the eastern pier, exhibits a bright light, at 20 feet above high water, but it is kept in only while there is eight feet of water in the harbour. Seen at six or seven miles off.

COAST *to the* EASTWARD *of* KINGHORN-NESS.—Two miles to the N.N.E. of Kinghorn-ness, is the bay of Kirkaldy. The shore is bold, having 9 fathoms near it. At the S.W. part of the bay, off the ruins of Seafield castle, extending to the distance of half a mile from shore, are some pointed rocks, called the *Vows*, some always above water, with 9 fathoms close-to. Thence to Kinghorn-ness the shore is rocky and steep.

In Kirkaldy Bay are from 9 to 12 fathoms, clean ground; and thence to Largo-bay, is, generally, clean ground in that depth, but either within or without it is foul.

Between Kirkaldy and Largo-bay, are the tide-havens of *Dysart*, *West* and *East Wemyss*, *Methel*, and *Leven*. Methel lies E. by N. 6 miles from Ravensheugh, the east point of Kirkaldy-bay. The shore between is chiefly low, rocky, and foul, to the distance of a cable's length off.

The conspicuous promontory called *Elieness* lies N. by W. ¾ W. from the Bass, and 8½ miles W.N.W. from May-island. The harbour of Elie, which is a good tide-haven, lies within the first point to the N.W. of the ness. The coast hence to Largo-bay is mostly foul, and some of the rocks lie nearly half a mile from the shore.

East and E. by N. 8 miles from Elieness, is the small tide-haven of *Crail;* and between lie the tide-havens of *St. Monance*, *Pettenweem*, and the *Anstruthers*. All the shore is rocky to the distance of a cable's length or more; but particularly off Billyness, near the west side of Anstruther. There is also a rock, called the *Ox*, lying a mile east of Elieness, and half a mile from shore, which is seen at spring-ebbs. Kinghorn-ness kept open without Elieness will lead clear of it.

FIFENESS lies E. by N. 2 miles from Crail, and 5 miles N. by E. from May Island. It is steep-to on the east, within half a cable's length of the shore: but, a mile to the W.S.W. of it, is a high black stone, by the sea-side, called Kilmenie-craig, which is conspicuous and remarkable. The shore between is foul to the distance of a cable's length.

The *Carr Rock beacon*, to the N.E. of Fifeness, is described hereafter.

DIRECTIONS.—Vessels steering in from sea, for the Frith of Forth, or Edinburgh Frith, in the latitude of May-island, and clear weather, will first make the land about St. Abb's Head, where it is high, and appears regular. The mountains of Cheviot, which are sometimes visible at the distance of 8 leagues, will, if seen, be readily known, as they rise above the land to the southward.

When the land of Fifeshire makes, you will perceive the Lomonds, Largo-law, Kelly-law, &c. which will appear, at unequal heights, like the tops of sugar-loaves, before the low land beneath can be seen.

In coming from the southward, a round hill, over Dunbar, which makes like the Bass, and has frequently been mistaken for it, will probably be seen. North Berwick-law, to the northward, will always, in clear weather, distinguish the Bass from this hill.

In coming into the Frith, from the southward, vessels may sail within the Bass, by giving the South Carr a good berth; and, having passed it, by giving the shore a moderate berth, may also go within Craig-leith, by keeping close to it, and then standing out between it and Lamb-island. The soundings in this passage will be found irregular, and the ground rocky.

It is, however, more usual, as it is more safe, to sail without the Bass, upon a N.W. by W. and W.N.W. course, until past Fidra; thence steering W. by N. to Inch-keith.

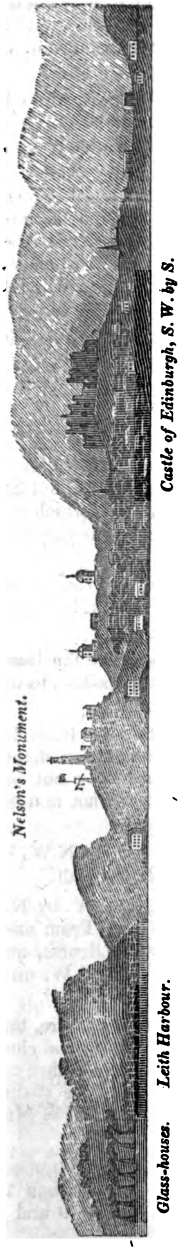
From midway between May Island and the Bass, the course to Inch-keith is W. by N.; from the south end of May Island, W. ½ N.; and, from the north end, West. From midway between May Island and the Fife-shore, the course will be W. by S. to Elieness, and thence West to Inch-keith, or, if close in with Fifeness, the course will be W.S.W. until abreast of Elieness, and thence West, as above.

The tides in the Frith will be found described hereafter; but it is to be noticed here, that vessels turning to windward, in the entrance of the Frith, should take the first of flood close to the south shore, and keep the last of it near the north side, by which they will have the advantage of seven hours of tide in their favour; for, it is to be observed that, the stream continues to run south round Fifeness half an hour after it changes on the north side of May Island, and an hour after it flows at the Bass.

In the night, when standing over to either shore, below Fidra and Elieness, approach no nearer than 20 or 18 fathoms; between Fidra and Gullenness, no nearer than 16 or 14 fathoms; but, west of Gullenness, you may stand into Aberlady-bay to 9 and 7 fathoms.

In every part of Aberlady-bay the ground is clean and good: the usual marks for the roadsted are, Gullenness E. by S., and Portseaton S.S.W. or S.W. by S.

There is, generally, good anchorage on the south side of the Frith, in all parts between Gullenness and Inch-keith, where there is a less depth than 16 fathoms. On the north side there is also good anchorage in Largo-bay, the N.E. side excepted, with gravelly ground,


Castle of Edinburgh, S. W. by S.
Nelson's Monument.
Leith Harbour.
Glass-houses.

in from 14 to 9 fathoms. The common marks are, Elieness E. by S., and Methel-pier N.N.W., in about 12 fathoms. With westerly winds, vessels may also anchor off the east-side of Inch-keith, in from 7 to 12 fathoms, soft ground.

The CHANNEL MOSTLY PREFERRED *in sailing* UP THE FRITH, is to the northward of Inch-keith. Large ships, in passing this way, must be careful to avoid the *Blea*, by keeping the remarkable point, called the Carling's Nose, well open to the southward of Inch-colm. This mark should be kept on until you are nearly as far up as Burnt Island church, that the bank which lies in the way, west of Petty-cur, may be avoided.

The course and distance from abreast of Kinghorn-ness to abreast of Inch-colm are W. by N. about 5 miles: the water deep, with hard rocky ground.

The road of Burnt Island is a little to the westward of the pier. The marks are, the pier E.N.E., or the high land over Kinghorn open a little to the southward of the black rock east of Burnt Island, and Stanleyburn N.N.W. Here is good clayey ground, in from 9 to 12 fathoms. Be cautious of not going too near the Commons to the westward.

TRACK TO LEITH.—Vessels bound to the roads of Leith, from the north side of Inch-keith, must give the black rock, which always appears above water, off the N.W. point of Inch-Keith, a berth. Thence they may steer to the southward, on either side of the Gunnet. The buoys will be a sufficient guide for avoiding the rocks; but, should they be gone, keep North Berwick-law open to the north of the Long-craig, until the house, called Grange-house, opens to the west of Burnt-island church, when you will be clear of the rocks, and may steer to the southward. The course to Leith-roads will be about S.W. 2½ miles. In running over, in thick weather, or in the night, by keeping the lead going, you may know when you are in the roads by the water's deepening one or two fathoms. The instant that you find it shoalen thence, drop your anchor, and be cautious not to get too far to the eastward, toward the Beacon-rocks.[*]

LEITH ROADS.—The MARKS for ANCHORAGE in the roads are, Lord Roseberry's house[†] open north of Cramond Island, and Edinburgh-castle a ship's length west of Newhaven, in 5 fathoms, with muddy ground. Large ships should keep Lord Roseberry's house a ship's length open to the north of Cramond Island, as the deepest water lies in that direction.

It remains to be noticed, that the wreck of a sunken sloop, loaded with stones, lies in the roads, with Edinburgh-castle a very little open to the east of Newhaven, and Roseberry-house just in sight over the low point of the north end of Cramond Island.

CHANNELS to the SOUTHWARD of INCH-KEITH.—The Channels to Leith Roads, southward of Inch-keith, are good: the ground generally soft, and the tide easy. The *black buoy* on the Herwit, the *beacon-buoy* on the North Craig, and the *red buoy* on the Craig-waugh, are sufficient for pointing them out by day; and by night they must be avoided. (See the description of the shoals and buoys, page 103.)

In sailing up the Frith to the channel between the North Craig and Craig-waugh, (or to between the beacon-buoy and red buoy,) stand into Aberlady-bay until North Berwick-law comes on with the high land within Gullenness, taking care, at the same time, to keep the Law open to the north of the notch on the south end of the high land: continue with this mark on, until Lord Roseberry's house comes in sight; then, keeping this house just touching the north point of Cramond Island will lead into Leith-roads. Observe, however, when passing Leith-craigs and the beacon-rocks, to open the house a little north of the island, in order to avoid the Symons.

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[*] We have already noticed, in page 103, that the Gunnet has a *white buoy* on each end; and that the *Pallas Rock*, between the Gunnet and Inch-keith, has a buoy painted with black and white stripes. Hence those who find it requisite to pass between the Gunnet and Pallas Rocks leave the striped buoy on the larboard, and the white buoy on the starboard, side. The course and distance thence to Leith Roads is nearly W.S.W.

Lord Roseberry's house is white, and stands by itself on the south shore.

In turning when within the North Craig, you may stand to the Herwit, until the westernmost glass-house at Leith comes nearly on with Edinburgh-castle; to the Craig-waugh, until North Berwick-law comes within its own breadth of the notch above mentioned; and, to the Beacon-rocks and Leith-craigs, until a remarkable notch in the land over Inverkeithing comes apparently near Mikry Island.

Should night come on when you have advanced to the North Craig, between the Herwit and Craig-waugh, you may, in fair weather, continue your course, by means of the light on Inch-Keith. With the light N.N.W., you will be within these shoals, and may thence, with the lead going, steer W.N.W., until the light bears N.E. ½ E., when you will be the length of the roads.

To SAIL FROM LEITH ROADS, UP THE FRITH, with a flood-tide, steer over to the northward till Dunibrisle, Lord Moray's house, is shut in by the west end of Inch-colm: keeping it thus will lead up clear of the Oxscars. Should the weather be thick, you may steer across the ridge, until the water deepens to 14, 15, or 16, fathoms, when you will be to the northward of the Oxscars, and may steer for Inch-colm, and thence W. ½ N. or W. by N. to North Ferry-point; or more to the northward into the bay of Inverkeithing, or St. David's-road, which lies 2 miles to the west of Inch-colm. The marks for anchoring in this road are, Kinghorn-ness open to the northward of Inch-colm. South Queen's Ferry open to the southward of the island called Inch-garvy, and St. David's-pier N.N.W., in from 7 to 10 fathoms, muddy ground. There is most room in the eastern part of the road.*

Vessels from Leith-Roads may pass it to the southward of Mikry Island, by keeping Inch-garvy just shut in behind Hound-point, until abreast of Mikry. This will lead clear of the reef, which extends half a cable's length from the south part of the island. Off the south end of Mikry are 3 fathoms. In passing the island, give it a berth of about a cable's length, steering across the tail of the Drum-sand, which lies to the southward, in not less than 12 feet, and thence to the northward.

Instead of sailing to the southward of Mikry Island, you may, if more agreeable, pass between it and the Mikry-stone, as there is a clear channel between, of not less than 9 feet at low water. Near Mikry-stone, on the west side, are 3 fathoms. From this place be cautious to keep the Long-craig (heretofore described) at least its own length open to the northward of Mikry-stone, until all the houses of South Queen's Fefry come open of Hound-point. This will lead clear of the Drum-sand, which dries from Hound-point half-way over to Mikry Island, but has, near its elbow, 10 fathoms of water.

In proceeding between Inch-colm and the road of Inverkeithing, keep the Haystack open to the northward of Inch-colm, until the westernmost houses of South Queen's Ferry pass Inch-garvy; as this will lead clear of a rock, called *Doig's-Rock,* which lies S. by E. ½ E. from the pier-head of St. David's, and about three cables' length from shore. The rock has only 3 feet over it at low water, and lies with the middle of the Haystack on the north point of Inch-colm, and the middle of Inch-garvy on the easternmost houses of South Queen's Ferry.

There is a channel on each side of Inch-garvy, but that on the north side is the best. Having passed this island, you may see a round rock, nearly covered with spring-floods, called the *Bimer,* and may pass on either side of it; but the south side is to be preferred. Between this rock and Inch-garvy the whirl and rapidity of tide frequently, in light winds, render it difficult to conduct a vessel. The Bimer is very steep all round; and, on the south side of it, the depths are upward of 30 fathoms. To the northward of it, on the shore, are some rocks above water, called the *Long Craig.*

Between Bimer and the North Ferry is a sunken rock, called *Mackintosh's Rock,* of only 10 feet at low spring-ebbs. This rock lies E. by S. 3 cables' length from the Bimer. On the inside, between it and the Long-craig, are from 5 to 3 fathoms; and, on the south side, 17 fathoms, close-to. It lies with the Bimer W. by N. on with the west corner of the wood at the west side of Hopeton-house;* the house on Inch-garvy S.E. by S. on the pigeon-house in Lord Roseberry's park; and a farm-house to the westward of North Ferry N. by E. on with a round hill above it.

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* QUEENSFERRY LIGHTS, above Inch Garvy.—A bright fixed light is exhibited at *New Halls,* near South Queen's Ferry, and another at the principal slips or piers of the North Ferry, for the of the ferry-boats in *dark* nights; clear moon-light nights being excepted.

Above the Bimer the course up the Frith, to the tide-haven of Lime-kilns, is N.W. ½ W. 4 miles. The water in the channel gradually shoalens from 16 to 8 fathoms. When past the Bimer, keep a little to the northward of mid-channel, in order to avoid the Society-bank, which extends nearly one-third of a mile from the shore at the Society-houses, and mostly dry, though its edge is very steep.

About two miles N.W. from the North Ferry, and half a mile from shore, is an islet, called *Dove-craig*, with a flat of sand extending out to about a cable's length. When past this island, you may haul up and anchor at pleasure in Lime-kilns Road, or with Dove-craig S.E. by E. or E.S.E. one mile distant, and the pier of Lime-kilns N.E. or N.E. by N., in 7 or 8 fathoms, muddy ground.

FIFENESS *to the* RED HEAD; *including the* RIVER TAY *to* DUNDEE.

NORTH CARR.—A long reef of rocks, of which the outer part is called the *North Carr*, stretch off from Fifeness, a little to the northward, and to the distance of more than a mile from shore. The Carr is dry at the last quarter of ebb, and appears to be nearly of the size of a boat. It is steep on the South and S.E. sides, with 12 fathoms close to it, but has a little reef stretching to the northward. Kilmenie-craig (heretofore mentioned) kept open in sight without the land, leads clear to the southward of it; Sparkleton-hill, the highest hill seen on the southern land, on with May-Island, leads clear to the eastward; and Luckly-hill open north of Barbet-ness leads clear to the northward. With the last mark on, the steeples of St. Andrew's will be seen over the low point of the Ness. The battlement of Crail-steeple (if not seen from too great a height) kept in sight above the land, is likewise a good mark to clear it. With Balcomie-house on with a little sandy bay on the north side of the Ness, you will be abreast of the rock.

The Commissioners of the Northern Lighthouses gave notice, on the 5th of July, 1822, that a Beacon had been erected upon the Carr Rock, of the position and appearance of which the following specification is given by Mr. Stevenson, their engineer:—The Carr Rock forms the seaward ledge of a range of sunken rocks, extending about 2 miles from Fifeness. By compass, it bears S.W. by W. from the Bell Rock, distant 11 miles, and from the Isle of May Lighthouse N.N.E. ¼ E. distant 6 miles. The lower part of the Carr Rock Beacon is a circular building of masonry, measuring eighteen feet in diameter, which forms a basement for six pillars of cast-iron, terminating in a ball three feet in diameter, which is elevated about 25 feet above the medium level of the sea; the whole, at half-tide, appearing somewhat like a vessel under sail at the distance of 2 or 3 leagues. The erection of this beacon has been attended with great difficulty, having occupied six years, in the course of which the works sustained occasional damage. Mariners are therefore warned, when they run for the Carr Rock Beacon, to do so with caution, both on account of its exposure to the breach of the sea, and its liability to receive damage from vessels under sail.

From the North-carr, the course and distance to Barbet-ness are, N.W. by N. 4 miles; to Tay-bar, N. ¼ E. 9½ miles; to Aberbrothic, or Arbroth, N.N.E. 16 miles: and to *Red-head*, N.N.E. ¾ E. 19 miles.

BELL-ROCK.—Nearly N.E. by E. 10½ miles from Fifeness, and 14 miles N.E. from May Island, lies the Bell Rock, called also the *Inch-cape*, or *Cape-rock*. This rock, which has heretofore been the most dangerous rock on the eastern coasts of Scotland, is situated at the opening of the bay formed by the Red-head, in Forfarshire, on the north side, and Fifeness on the south; and about 5 miles on the outer side of a line drawn between these two points. It lies in a N.E. and S.W. direction for about three-quarters of a mile, and for about two-thirds of that length is dry at low water. The N.E. end, which is the highest and broadest part, continues dry till half-flood. There is very deep water close to it all around, excepting at the S.W. point, which is flat, extending about a quarter of a mile, and in that direction the danger from shallow water extends farther. The losses on the rock have been many; and in some cases, all the persons on board have been lost; for, from the ruggedness of the surface, the vessels driven on it have been almost instantly dashed to pieces by the waves.

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* Hopeton House is surrounded with trees, and stands on a rising ground, on the south side. A little to the eastward of it are the remarkable houses called the Society Houses.

This rock lies with the following marks: namely, the Isle of Bass, S.W., on with the north side, or sloping part, of May Island; St. Andrew's college-steeple, W. ¼ N., on with the small Lomond; and Dick's-mount on with the Pot. Dick's-mount is a round hill, lying inland above Aberbrothic; and the Pot is a remarkable hollow in the cliff, at a mile to the north-eastward of Aberbrothic.

Induced by the number of wrecks which had been made on the rock, Mr. Charles Roberts, a very ingenious and well-informed master in the Royal Navy, made a survey of it, in the year 1802; from which he found that it trenches in a line toward Fifeness, S. 24 deg. W. by the pole, or nearly S.W. ¼ W. by compass. It is bold and steep-to, excepting on the S.W. end, where it runs off in a flat. On the inside, close to the rock, there are 12 fathoms of water; and, on the outside, from 16 to 22. The breadth of the rock is a hundred and ten yards; its length nearly half a mile, dry at low water; on the N.E. end the surface is very uneven; but, in general, the rocks are from 4 to 8 feet above the low-water mark for nearly a quarter of a mile, and at high water spring-tides there may be from 10 to 12 feet over the highest part of them, as the tide rises at the springs about 20 feet; and then, if the wind is in any direction off the land, it becomes particularly dangerous; as, from the smoothness of the water, in consequence thereof, there is then no break, and its landmarks are so distant, that, if there be any haze on the shore, they cannot be seen; and, at all times in the night, which is very long in winter, land-marks can be of no service.

From these circumstances, at the instance of the Commissioners for the Northern Lighthouses, the Legislature, in the year 1806, passed an Act, empowering the commissioners to erect a lighthouse upon this rock, and to levy certain rates for defraying the expenses of erecting and maintaining the same.*

This lighthouse, the most honourable, useful, and important, ornament of the eastern coasts of Scotland, was completed in December, 1810. It is constructed on the principle of the Eddystone lighthouse, in the English channel, but is more ample at its base, being 42 feet in diameter, and it is 23 feet higher than than of the Eddystone.—*(See its figure on the Chart.)*

The foundation-stone of the building is nearly on a level with low water of ordinary spring-tides; and, consequently, at high water of those tides the building is immersed about 15 feet; but, during the progress of the work, the sea-spray has been observed to rise upon the lighthouse to the height of 90 feet, even in the month of July. The building is of a circular form, composed of great blocks of stone. The ground-course measures 42 feet in diameter, from which it diminishes as it rises; and, at the top, where the mason-work finishes, and the light-room commences, it measures 13 feet diameter. Here the cornice forms a walk or balcony around the outside of the light-room. The stone-building measures

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* The preamble to this Act states that, under the authority vested in the Commissioners, by preceding acts, nine lighthouses had, at different times, been erected on the coasts of Scotland; viz. one on Kinnaird's-head, in Aberdeenshire; one on North Ronaldsha, in Orkney; one on the point of Scalpa; one on the Skerries, in the west; one on the Mull of Cantire; one on the Isle of Plada, near Arran; two on the Pentland Skerries, in Orkney; one on the island called Inch-keith, which we have already noticed; and one on the Start-point of Sanda, one of the Orkneys.

The rate payable for this light by every British merchant-ship, or decked vessel, sailing from any place between Peter-head and Berwick-upon-Tweed, whether on a foreign voyage or coastwise, or by any such vessel as may sail within a line supposed to be drawn from Peter-head to Berwick, is three-halfpence per ton; foreign vessels, threepence per ton. Vessels sailing from one port to another, westward of Queen's Ferry, in the Frith of Forth, and vessels sailing only from one port to another, in the Frith of Tay, are, however, exempted. No greater duty is to be paid for passing all the lights above mentioned than that here specified.

Should the funded surplus of the duties at any time hereafter amount to a sum of which the interest will defray the expenses of the light, the rates are to cease.

sures 100 feet in height; but the total height of the lighthouse, including the light-room, is 115 feet. As far as the entrance-door, which is 30 feet from the ground-course, the building is entirely solid, excepting a small hole, cut in the centre-stones for the drop of the weight of the machinery.

Round the balcony there is a cast-iron rail, curiously framed. The light-room is of an octagonal form, 12 feet in diameter, and 15 feet in height, constructed chiefly of cast-iron, with a dome-roof of copper, and the window-sashes all round are glased with polished plate-glass, one-quarter of an inch in thickness.

The lighthouse being completed, it was first lighted in the evening of the 1st of February, 1811, and is to be regularly continued.

The light is from oil, with reflectors, at the height of 90 feet from the level of high water of spring-tides. To distinguish it from others on the coast, it is made to revolve horizontally, and to exhibit, from all points of the compass, a bright light and a light of a red colour, alternately; both showing themselves in the space of three minutes; so that, in each revolution of three minutes, there will be seen a brilliant light, appearing, at a distance, like a star of the first magnitude; which, after attaining full strength, diminishes and disappears. The coloured light, being less powerful, may not be seen when the bright light is first noticed; but the periodical revolution of the bright light will be sufficiently distinguishable.

In thick and foggy weather a bell will be tolled, by machinery, night and day, at intervals of half a minute.*

At Arbroth, each of the light-keepers has a house provided for his family. Connected with these houses there is a signal-tower, where an excellent telescope is kept, and a set of signals arranged with the people at the lighthouse for the attending-vessel, which carries off the stores, fuel, &c. The master of this vessel acts as superintendent, and has the charge of the building and stores kept at Arbroth.

From the Bell-rock lighthouse, the bearing and distance to the North-carr are S.W. by W. 9½ miles; to the Bar of the Tay, N.W. by W. ½ W. 9 miles; and to Red-head, N. ¼ E. 10½ miles.

The HARBOUR of St. ANDREW'S lies 4 miles N.W. ½ W. from Barbet-ness. The shore between is rocky and steep, with 7 fathoms close to it. Vessels turning should not stand nearer than in 9 fathoms. In the whole of St. Andrew's-bay the ground is clean, with from 9 to 12 fathoms.

The towers and spires of the venerable city of St. Andrew's give it, at a distance, an air of magnificence, but which, on a nearer view, present a scene of ruins and decay. Among these are the vestiges of its once celebrated cathedral, a quadrangular tower of which is supposed to have been used as a lighthouse. Some ruins of the castle yet remain on the east side of the town, seated on a rock overhanging the sea, at the height of about 100 feet. Its university is now the first object of pride to the inhabitants.

The harbour is sheltered by a pier. It is dry, but very safe for small vessels. The entrance is narrow, and lies on the south side of the pier-head. At spring-tides there are from 12 to 14 feet in it, and 9 or 10 at neaps. If bound in, run a little to the southward till the pier is nearly end-on, and then steer along the south side of it, into the harbour.

FRITH of TAY.—The BAR of the TAY lies considerably without the mouth of the river, and 7 miles N. by E. ½ E. from Barbet-ness. It is connected to the shore by two long sands, stretching to the eastward. Of these, that on the north side, which is called the *Gaa*, dries at low water, and extends S.E. 2½ miles from Button-ness; and that on the south side, called the *Abertay*, or *Lady-bank*, which runs nearly parallel to the former, is dry at low water, half-way out. This sand extends 4½ miles E.S.E. from Tents-moor-ness to a buoy upon the bar. At the buoy there is a depth of 2¼ fathoms. These sands are flat on their outsides, but the insides are steep. The outer end of the Gaa lies a mile N. by E. ½ E. from the buoy on the extremity of the Abertay; between is the *Cross-sand*, or bar, lying in a sweep to the eastward. Upon the bar, at spring ebbs, there are 15 feet of water; and, without, the water deepens gradually to 10 or 11 fathoms, at the distance of a mile and a half.

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* For an interesting history and more complete description of the lighthouse, see the Edinburgh Annual Register, for 1809.

"During the gales of January, 1835, the sea ran unusually high. The monthly returns from the lighthouse stated that, on the 17th day of that month the spring-tide waves rose to the height of 116 feet, and *drifted over the building;* and on the 18th and 19th they rose to 110 feet. It is worthy of remark that the ground-swell, or heaviest sea, preceded the highest wind by two days. Several large masses of rock, called '*travellers*' by the lightkeepers, were thrown from the deep upon the rock; one of which measured 8 ft. 6 in. in length, 2 ft. 6 in. in breadth, and 4 ft. in thickness; and in weight about 5½ tons. The visitation of these *travellers* is a source of great interest to the light-keepers, who proceed to break them up with large hammers, when at all manageable, to prevent their drifting upon the cast-iron railways or landing wharfs."

Vessels coming out from the FRITH *of* FORTH, *and bound to the northward, without the* BELL-ROCK, in light clear weather, should bring the Bass open to the eastward of May Island, and keep this mark on until the small or southernmost Lomond comes open of the northernmost steeple of St. Andrew's. In the night, they may steer out, with the May-light bearing S.W. by W. or W.S.W. for about 18 miles, making allowance for tide, and may then haul to the northward, or N.N.W. for the Red-head; observing to approach no nearer to the latter than in 20 or 18 fathoms; or, to the northward of the head, than in 30 fathoms. Close to the Bell-rock, on the eastern side, are 30 fathoms, with a less depth farther to the eastward.

A N.N.E. course from the North-carr will lead in a fair channel *within* the Bell-rock. The depths 13 to 15 fathoms. When the small Lomond is open to the northward of St. Andrew's, you may proceed to the eastward.

Vessels, in the night, by keeping in 18 fathoms, may pass along the south shore of Fifeness, and thence clear of the Carr to St. Andrew's bay: but if, when crossing the bay, the depth should decrease, you may, with the lights on Button-ness W. by N., stand out again to the depth above mentioned; and thence, in the same depth, to a berth off the Red-head, which may be readily known by its high red cliffs. From a distance the cliff appears steep, level at the top, with one or two sudden falls near the north end. The land over it, from Dundee thence to the north of Montrose, appears afar off, and more broken than the land to the northward.

In crossing St. Andrew's Bay, and turning to windward, stand no nearer to the North-carr than 20 or 18 fathoms; between the Carr and Barbet-ness than 12 fathoms; between Barbet-ness and Tay-bar than 10 fathoms; between Tay-bar and Aberbrothic than 13 fathoms; and, to the Red-head, than 16 or 15 fathoms. You may stand off to the Bell rock to 19 fathoms; and, in that depth, either to the northward or southward, will be in a line either between it and Fifeness, or between it and the Red-head.

Vessels embayed in the Bay of St. Andrew's, with easterly winds, must make allowance for the flood, as it sets strongly to the westward on the north side, and slowly to the eastward on the south side. The latter is therefore to be taken until the ebb makes, when the tide will carry you out to the northward.

RIVER TAY.—If bound for the Tay, from Fifeness or the North-carr, shape such a course as will shut May Island in behind Fifeness; and continuing upon this course until Tay lights upon Button-ness come in sight. Then bring Button-ness N.N.W. ½ W., and steer with it so until the two lighthouses, appearing on the point under the hill, come on with each other. By running in with them in this direction, you will go in safely. In the day-time, the old tower, called Broughty-castle, bearing N.W. by W., or within a sail's breadth of the north side of Dundee-law, is a good mark for sailing in or out. Button-ness is remarkable for its red sand-downs; otherwise it is low and sandy.

In coming in, the water will be found to shoalen gradually from 8 to 3 fathoms; but, within the bar, are 5, 7, and 9 fathoms. With the great lighthouse to the eastward of a remarkable notch in Sedley-hills, at two hours' flood, and the bar smooth, vessels drawing 15 feet may steer directly in for the light; as keeping it a ship's length open east of the notch will lead close to the eastward of the buoy before mentioned.

As the water breaks from side to side of the entrance in bad weather, especially when the tide runs against the wind, a stranger's going in at such times must be attended with danger. Such should, if possible, wait until the flood-tide is well made; and, when over the Cross-sand, or bar, they ought not to approach nearer to the Gaa than 5 fathoms, nor to the Abertay than 6 fathoms. If obliged to attempt the harbour with an ebb-tide and an outerly wind, carry very little aftersail, that your ship may quickly wear from either side, when the tide, by taking her upon either bow, shall render such celerity necessary.

Drumlaw-sand lies on the north side, off the church and village of Money-feith; you

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avoid it by not going into less than 3 fathoms of water on that side. On the south side of the channel, from the Abertay-sand round Tentsmoor-ness, and as far as the South-ferry, it ebbs dry a long way off from the shore. The Mussel-scars lie on the outer edge of this bank or flat at low water mark. The Horseshoe runs off E.S.E. from Broughty, toward the easternmost Scar, and has 8 or 9 feet on it at low water. This is a hard ridge of stones, lying half-channel over from the north shore, reaching down, and slanting off, to a mile below Broughty-castle. Here the tide runs strongly; the channel is half a mile wide, and has only 3 or 4 fathoms in it at low water. Below and above the Horseshoe are 7 or 8 fathoms of water. From Broughty, up to the Ferries, are 11 or 12 fathoms in the channel. Off the west end of the town of North-ferry you may anchor in 7, 8, or 9 fathoms of water; and off the South-ferry, with the town bearing south, in 5 or 6 fathoms. From the South-ferry up to Dundee the course is West and W. by N., and the distance 3 miles. The small sand, called the Newcome, is the only danger lying between them: it lies a mile above the South-ferry, and dries at low water. You avoid it by not coming within half a mile of the south shore: in the channel, just to the northward of the Newcome, are 6 fathoms at low water. The channel, from the Ferries up to Dundee, shoalens gradually from 9 to 3½ fathoms at low water. The pier-harbour of Dundee falls dry at low water; at high-water, spring-tides, it has 14 or 15 feet of water in it; and, in neap-tides, 9 or 10 feet.

If bound to the pier, steer up with the lighthouse on the castle, until abreast of the glass-houses: you will then see a beacon on a rock, which is covered at high water, between you and the pier. Steer to the south of the beacon, giving it a small berth until abreast the pier, where you may anchor in the depth above mentioned.

In a large ship you may anchor in the Ferry-road, off the westernmost houses on the north shore above Broughty-castle, with the great lighthouse on with the castle, in 9 or 10 fathoms. All the ground in the river is sand or gravel.

LIGHTHOUSES for the navigation of the TAY. The lighthouses on Button-ness above mentioned, are two white towers, surmounted by the leading lights for passing over the bar of the Tay. They are, respectively, 70 and 50 feet in height, and the lanterns are at 85 and 65 feet above high water. The distance between them is 1122 feet, and they bear, when in a line, N.N.W. ½ W. The lights are *brilliant* and *fixed*, and may be seen from three to four leagues off.

SOUTH FERRY.—Two leading-lights for the fair-way, between the Abertay Bank and Button-ness; 1321 feet from each other, and bearing, when in one, N.W. by W. ¼ W. The towers are white, the lights brilliant, and may be seen from three to six miles off, the lanterns being respectively at 65 and 45 feet above high water.

DUNDEE HARBOUR.—Two light-towers on the eastern and middle piers, bearing, when in one, N.W. ¼ W., and leading to the southward of the Beacon Rock. They are only 10 and 12 feet above high water, and seen 3 or 4 miles off. In entering the wet-docks one light is left on the starboard, and the other on the larboard, hand.

DUNDEE FERRY.—Three lights for the guidance of the ferry-boats: one being on the Craig-pier of Dundee, the others at Newport on the south shore. The latter in one, bearing S.S.W. lead clear of the east end of the Middle Bank.

Since the 1st of August, 1837, the high light in the tide-harbour, immediately to the westward of King William's dock-gates, instead of a brilliant light, as formerly, is now a *red* light; and which, seen to the S.E. with the red light on the east protection wall, leads vessels clear of the Beacon Rock.

From TAY-BAR *to the* RED-HEAD the course and distance are N.E. by E. 11 miles. The shore is bold all the way, excepting the Carr-end, a reef of rocks, lying 2 miles W.S.W. from Arbroth, which must be carefully avoided.

Off the head the tides run very strongly, which often causes a rough sea, especially when the stream goes against the wind. Within a mile of the shore are 20 fathoms of water; in the night-time, or in hazy weather, your keeping in about 28 fathoms will be in the best depth on this part of the coast.

ABERBROTHIC, or ARBROTH, is remarkable for the ruins of an old abbey at the north part of the town. Its situation is N.E. by E. ½ E. 7 miles from Button-ness. The roadstead is three-quarters of a mile without the harbour, in 9 and 10 fathoms. The harbour is dry, but very safe. Half way between Arbroth and the Red-head is the fishing-town of Achmuthie.

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RED-HEAD *to* BUCHAN-NESS.

MONTROSE.—*Montrose-ness*, or *Scurdy-ness*, the south point of the entrance of Montrose, lies 4 miles N.E. from Red-head: between, lies the bay of Lunan, wherein ships may ride, with off-shore winds, a mile to the northward of the Red-head, in 6, 7, or 8, fathoms of water, with the Red-head South, or S. by W. Montrose is a place of considerable trade; but the rapidity of the tides, and the narrowness of the channel, together with the sand-bank called the Annet, by its extending a mile from the north shore into the sea, render it necessary for a stranger to employ a pilot. Montrose-ness is a low rocky point, with a battery upon it. Directly off the Ness is a flat rock, called the *Stone* or *Out-Stone*, reaching more than a cable's length from the shore, with its outer part dry at low ebbs. There is also another large rock, called the *Instone*, which appears at half-ebb, lying in the channel. You may avoid these rocks by not going nearer than in 6 fathoms.

The road of Montrose lies a little to the northward of the harbour's mouth. The usual marks are, the spire-steeple of the town on Turin-hill, bearing W. by N. or W.N.W., in from 8 to 10 fathoms, sandy ground; more to the southward the ground is foul; but, to the northward, vessels may anchor from half a mile to a mile off shore, as far as the mouth of Northesk-river, in a clean sandy ground.

The town of Montrose stands on the north side of the harbour, about a mile and a half from the entrance. Opposite to the town is an islet called the *Inch*; and, to the west, there are three hills in the country called the *Three Horses*, each having its south side very steep. Observe that, as the tide runs across the entrance, you must have plenty of sail. If the weather be clear, a good mark to run in by is the house on the Inch on with the middle hill of the Three Horses; the house then appearing a little without the Black-rocks on the south shore. Then give the Instone a berth, and steer up the mid-channel to Ferrydan, where you may come to an anchor. If bound up to the town, steer to the northward from Ferrydan, keeping the starboard shore aboard all the way up to the kay; so as to avoid the Muscle-scalp, a danger covered at half-flood, lying off the N.E. side of the Inch, and over which the tide sets with great strength, after it has risen above it.

We retain the preceding marks, because they are descriptive, although rendered, in some degree, unnecessary, by the late improvements of Montrose Harbour, which are of great importance: a considerable addition to the piers having been made; the kays much improved; and two light-towers added, as the leading mark for the harbour. Large vessels may now reach the kays at neap-tides. A new beacon on Montrose-ness serves, likewise, as a mark of approach to the harbour.

To Mr. J. Bisset, Secretary to the Harbour-Committee of Montrose, we are indebted for the following information:

The ENTRANCE of MONTROSE is deep and spacious, though the Annet, on one side, and the Leads, on the other, render it difficult to take. Vessels should not come too near, as the lights now are well seen 5 or 6 miles off. The vessels can lay their course as directed beneath, and boldly come in, with or without a pilot, in the darkest night.* It is, however, requisite to be cautious when taking the harbour with a high wind from the north, as the tide then runs strongly across the Annet, and is apt to carry a vessel on the South Rocks.†

The following is a copy of the official notice:

"Notice is hereby given by the Committee of Harbour Lights of Montrose, with the approbation and concurrence of the Magistrates and Council, that two leading lights, for the direction of shipping into the entrance of Montrose Harbour, have been erected on the north-eastern side of the river, which will be lighted on the evening of Monday, the 21st instant; and will thereafter continue to be lighted every night, from the going of day-light in the evening till the return of day-light in the morning.

"The lowest of the towers, from which these leading lights are to be exhibited, is 30 feet high, and is placed, near high-water mark, on the Sandness, about 1200 yards within the point of the Annet Sand, at low water; and the other about 400 yards up the river, 55 feet high.

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* The lights require only ¾*d.* per ton of dues from all vessels entering.

† A floating beacon was placed on the point of the Annet sand in the year 1821.

"To enter the river, these lights are to be taken in a line, nearly in the direction of the stream of the river; the course about W.N.W.

"From this description of the position of these lights, mariners will judge of their situation in entering the harbour, relatively to the Annet Bank on the north, and the rocks called the Leads and the Stone on the south.

"The lights of the towers are from oil, with reflectors; and, in order to distinguish them from all others on the coast, shades of glass, of a *red colour*, are placed before the reflectors, which will give the light a *red* or less luminous colour; but the lights will be seen, in a favorable state of the atmosphere, at the distance of four to six miles in the offing of the harbour.

"As the towers are white, they will serve for landmarks to take the harbour in the daytime; and, as there is 15 to 18 feet of water on the bar at low water, vessels may safely run in, at any time of tide, in an easterly storm." Vessels can anchor in a roadstead called the Stell, about three-quarters of a mile up.—Montrose kays are a little farther up.

TOD-HEAD lies N.E. ¾ E. 17 miles from the Red-head, and N.E. by E. 11½ miles from the entrance of Montrose. It is low, and therefore not easily known. The high hill of Craig-davie, to the northward of Inverbervie, is commonly mistaken for it. Hence to *Girdleness*, the south point of the harbour of Aberdeen, the course and distance are N.E. 17 miles.

Between Tod-head and Girdleness, at the distance of 7 miles from the former, is the pier-harbour of *Stonehaven*, or *Stonehive*. To sail into this place, run close along the rocky shore, on the south side of the bay, until within a cable's length of the pier-head: then steer directly for the latter, so as to go round its south end into the harbour. There is in this harbour 16 or 17 feet of water at high spring-tides; and easterly or S.E. gales occasion a great swell.

At about a mile and a half to the southward of Stonehaven stand the remains of the once magnificent *Dunnottar Castle*, upon the top of a stupendous insulated plum-pudding rock, with towers rather resembling a deserted city than a dismantled fortress. On landing, it may be approached by a steep path, winding round the body of the rock, though not by any connection with the land, from which it is divided by a wide chasm. The shore is very bold, rising to an equal height with the castle, and bending round it in a horse-shoe form.

In sailing from Stonehaven to Girdleness, give the shore at least a cable's length berth. In passing Girdleness, it is also requisite to notice that the *Girdle-rock*, a dangerous rock, lies at a little distance without that point.

GIRDLENESS LIGHTHOUSE.—On Girdleness is a lighthouse, which was first lighted on the 15th of October, 1833. It is situate in latitude 57° 8′, and longitude 2° 3′ W. Immediately off it lies the sunken rock called the *Girdle*.

The lighthouse bears from the North-pier of Aberdeen S. by W. 1220 yards; from Buchan-ness lighthouse S.W. ½ W., 25 miles; from the Bell Rock Lighthouse N.E. ¼ N., 43 miles. Its two lanterns are open or glased from N.N.E. to W.S.W. ½ W. and intermediate points, easterly and southerly. Variation, 26° 45′ W.

The tower exhibits two brilliant fixed lights, appearing vertically within a certain distance distinctly like stars of the first magnitude; but beyond that distance the two lights will appear as one, having an elongated form. The lanterns are elevated respectively at 115 and 185 feet above the mean level of the sea, and the lights are seen, in clear weather, at 13 and 16 miles off.

ABERDEEN.—*The Bay of Aberdeen* lies immediately to the northward of Girdleness. In this bay vessels may ride well with off-shore winds, Girdleness bearing S. by W. or S.S.W., and the two steeples of Aberdeen in one, in from 7 to 9 fathoms. Strangers bound into the harbour should have a pilot, as the entrance is narrow, and the sands frequently shift.

The harbour lies close in, on the north side of Girdleness. The north side of it is formed by a pier, which runs into the sea, and the south side by another pier along the shore. Upon the north pier-head is a flag-staff; and, at the distance of nearly half a cable's length from the outer end of the south pier, is a beacon, standing upon a reef, that stretches out from the south shore: at half a cable's length from this reef is another reef, called the Shortness. The latter lies from the south shore at about the same distance; and hence the bar crosses the entrance of the harbour to within but little more than half a cable's length without the outer end of the North Pier-head. The bar has but two feet on it at low water, but, at high-water, of spring-tides, 16 feet; and, with neaps, 12½ feet. When the water has risen to 9 feet on the Bar, or sufficiently high for vessels to enter the harbour, a flag by day, and a light appearing *red*, by night, is hoisted on the North Pier-head, to signify the same.

The bar lies with the north side of the south pier in sight, and old Aberdeen church, which has two pointed steeples, on with the east side of the Broad-hill. The course in, between the piers, is W. by S. ½ S. The channel in is nearest to the south pier, and thence close along the end of the jetty that runs out from the inner end of the north pier.

To sail over the bar, in the deepest water, keep the harbour fairly open, until the steeples above mentioned are shutting in behind the eastern part of the Broad-hill, and thence as above, when you may haul up into the harbour.

NEWBURG, a small, but safe, harbour, lies N.E. ½ N. 11 miles from Aberdeen. There is but 12 feet of water in it, with common tides; and, as the bar frequently shifts, it should not be attempted without a pilot.

The fishing-town of Colliston lies 2 miles E.N.E. from Newburg. The shore between Aberdeen and Newburg is low and sandy; but, a little to the S.W. of Colliston, it becomes rocky, and continues thus to a reef of rocks called the *Cruden-Scars,* which lie 4 miles E.N.E. from Colliston, stretching half a mile from shore. They are mostly above water, and steep-to. N.E. of them is a sandy bay, and the fishing-town called the Ward of Cruden. To the eastward of this is *Slains castle,* a very remarkable building, seen from sea. Off the Ward of Cruden is a sunken rock, called the *Buss,* lying a cable's length from shore.

BUCHAN-NESS and Lighthouse.—Twenty-four miles N.E. ¾ E. from Girdleness, and 5 miles N.E. ½ E. from the Ward of Cruden, is Buchan-ness, in latitude 57° 29¼', and longitude 1° 47' W. The coast is here composed of high rugged cliffs, with 12 and 14 fathoms close to them, and 30 fathoms at a little distance off. Stirling-hill, a round hill, with a heap of stones at the top, is frequently mistaken for the Ness.

Under the direction of the Commissioners of the Northern Lighthouses a lighthouse, erected on Buchan-ness, was first lighted on the 1st of May, 1827. The lantern is open or glased from N. by E. to S.W. by W. and intermediate points easterly.

The light, having a rather novel appearance, from the quick revolution of its reflector frame, is known to mariners as a flashing light, or twinkling light, which, in every five seconds of time emerges from a state of partial darkness to a transitory or momentary light, resembling a star of the first magnitude. It will thereby be readily distinguished from the slow motion and red colour of the Bell Rock light toward the south, and from the stationary light of Kinnaird Head toward the north.

The light is elevated 130 feet above the medium level of the sea. In clear weather it will be seen at the distance of 16 miles, and intermediately according to the state of the atmosphere.

From Buchan-ness, the bearing and distance to Tod-head are S.W. ¼ W. 13½ leagues; to St. Abb's-head, S.W. by S. 32 leagues; to Tinmouth-castle, S. by W. ¾ W. 49½ leagues; and, to Flambro' Head, S. ¾ W. 70 leagues.

TIDES *between* BERWICK *on* TWEED *and* BUCHAN-NESS.

Upon the full and change days of the moon, the tide flows at Berwick and Eyemouth, at a quarter-past two o'clock; at Dunbar, half-past one; in the Frith of Forth, Leith, and Burnt Island, at a quarter-past two; at Fifeness, by the shore, half-past one; St. Andrews', at two; Dundee, a quarter-past two; Tay-bar, three-quarters past one; Montrose and Stone-haven, half-past one; Aberdeen, three-quarters past twelve; Newburg, half-past twelve; and Buchan-ness, at twelve o'clock.

The perpendicular rise of tide, in feet, is nearly as follows: At Berwick and Eyemouth, springs 16, neaps 10; Dunbar, springs 15, neaps 9; Frith and Pier Havens, springs 16, neaps 8; St. Andrew's, springs 15, neaps 9; Dundee and Tay-bar, springs 16, neaps 10; Montrose and Stonehaven, springs 13, neaps 8; Aberdeen, springs 14, neaps 9; and Newburg to Buchan-ness, springs 13, and neaps 8, feet.

As the stream of tide, in the offing, sets to the southward, with considerable strength, at a great distance from shore, it follows, upon well-known principles, that the length of time, between the time of high water on shore and the time of high water in the offing, is in proportion: and here we find that the stream runs to the southward, in the offing, three hours after high water on shore. Gales of wind from between W.S.W. and N.W. are found to raise the tide higher, and cause the stream of flood to run some time longer in the offing. Easterly and S.E. winds have the contrary effect.

The velocity of tide is greatest against the projecting points, as at Buchan-ness, &c.; as also in passing over the fishing-banks off the coast, upon which the stream runs longer than in other parts after it changes on shore. In the bays, which fall out of the course of the tide, on the contrary, as between Montrose and John's Haven, and Aberdeen and Slain's castle, the current runs slowly, and turns sooner in proportion. But, in the Frith and other inlets, where the stream sets almost directly in, the currents become stronger, according to the decrease of breadth or depth.

Off the Mouth of the Frith, and St. Andrew's Bay, the tide is affected in its course by the flood setting in, and drawing the latter part of the ebb and first of flood, which answer to the in-land flood, in shore; and the ebb out of the Frith's forcing the latter part of flood, and first of ebb, from shore.

The stream off Buchan-ness, which is the strongest on this coast, runs with a velocity of about 4 knots in springs, and 2½ on neaps: and, it appears that, with neaps, the tide is sooner at its height, and does not run so long as with springs. At 6 miles off the ness, the stream of flood runs till 2 o'clock; and, at 12 miles off, till 3. Thence the tide continues, on a south course, over the fishing-banks toward the Staples; the stream ending 3 hours after high water on the adjacent shores. At the distance of 3 miles without the Staples, it runs until 4 o'clock; and, at 12 miles, until 5; continuing its course thence along the English Coast, at the distance of 5 or 6 leagues from shore, it runs until about 3 hours after high water on shore, as above.

From St. Abb's Head, the flood sets to the southward past Eyemouth, toward Emanuel Head, as already described.

The last three hours of ebb, round St. Abb's Head, set along the bay of Dunbar, and make the first of flood into the Frith. It begins to run up past the Bass, at half-past seven; and is, therefore, high water there at half-past one. The ebb, then coming out, joins the last of flood going to the southward, round the head, and continues near 3 hours, until the ebb makes without; which, coming from the southward, meets the ebb from the Frith, off Fal's castle, with a noisy rippling, continuing till the Frith flood again makes.

The Frith flood, upon the south shore, commences at Fal's castle, or between it and Dunbar; and sets to the west, pass the Bass, half an hour sooner than on the north side of May Island; particularly with southerly or S.W. winds, which quicken it on that side.

Past the Bass, on the days of full and change, the flood runs up till half-past one; and, on the north side of May Island, till two o'clock. The stream here runs only from between one and a half and two miles an hour, until between Inch Keith and Kinghorn-ness, where, on springs, it runs 3 miles. The stream in Leith-roads begins to run down, past the Beacon-rocks, nearly half an hour before high water.

Two miles without the *Red Head*, the flood, on full and change days, runs till 3 o'clock, though it is high water on shore at half-past one. Round this head the flood sets into St. Andrew's Bay, until its last quarter, which sets South and S.S.E. Westward of the Red Head, the flood sets W.S.W. along shore, past Aberbrothic and the bar of the Tay, toward St. Andrew's, running until two o'clock: and vessels passing Tay-bar, must be careful to allow for it, particularly in a calm, or with little wind, as it sets on the Abertay. The ebb, on the contrary, sets on the Gaa. From a little within Tay-bar, the tide takes the course of the river to Dundee, where it runs until half-past two o'clock.

From the Abertay, the tide sets strongly into the inlet called Edenmouth; but, between St. Andrew's and Barbetness, it is scarcely sensible. From Barbetness to Fifeness, the flood sets easily to the S.E. but increases in strength toward Fifeness. Without the North Carr it runs more strongly, and until half-past two o'clock.

Upon the Bell Rock, it is high water at half-past one, but continues to run without until 4. Within this rock, and off St. Andrew's Bay, the flood runs until 3 o'clock. The first part of it here, and off the Frith, setting in a direction for May Island, the middle to the South, and the last part S.E. The first part of ebb sets from E.N.E. to N.E., the middle N.N.E., the last part North and N.N.W.

The flood sets very strongly into the harbour of *Montrose;* and the stream runs until near 3 o'clock, setting across the mouth of the harbour, to the southward, over the Outstone, and the ebb to the northward, over the Annet, which must be attended to.

The flood also sets very strongly into the harbour of *Newbury*, but the current without does not set at the rate of more than one knot and a half. Very little tide sets into the harbour of Aberdeen; and, with freshes, the current always runs outward. The flood past Girdleness runs to the southward until half-past two. When strongest, it runs here at the rate of two miles and a half; neaps one and a half; and nearly the same past Tod-head.

SECTION IX.

BUCHAN-NESS *to the* PENTLAND FRITH *inclusive; with the* Islands *of* ORKNEY *and* SHETLAND.

The lands in general, which remain to be described within the limits of this section, are so high, as to be seen from a very considerable distance; although there are not, in some parts, a sufficient number of mountains to characterize one from another. *Mormount* is the only mountain in Buchan. This elevation lies 6 miles to the S.W. of Kinnaird's Head, and 12 to the N.N.W. of Peterhead. It may be seen from the northward, eastward, and southward, appearing long and high above the adjacent land, with a hollow in the middle, somewhat like a saddle; unless when it bears West or W. by N., as in this direction the land is end-on, and appears round. It may be seen from a distance of between 10 and 11 leagues.

In Caithness there are two very high hills, called the *Paps of Caithness*, with sugar-loaf tops, having some lesser hills about them. They may be seen, in clear weather, from the South and S.E., at the distance of 14 or 15 leagues.

The headlands, called Noss-head and Duncansby-head, are both very high steep rocky points, in appearance so nearly similar, as to be frequently mistaken for each other. But, even at a distance, Duncansby-head may be readily known by a large rock, about a mile to the southward of the head, which is called *John o' Groat's House* or the *Castle of Duncansby*, from its appearing over the land like a house upon a hill. It may, in clear weather, be seen 5 leagues off.

The Orkneys are in some parts mountainous; but the principal hill is that of *Hoy*, in the N.W. part of the island of that name, near Hoy-head, a remarkable high cape, forming one side of Hoy-mouth, the channel to Stromness. Shetland is generally high, and its coasts rugged and precipitous; being vast rocks of various heights, as more particularly shown hereafter.

BUCHAN-NESS *to* DUNCANSBY HEAD, *with the* MURRAY FRITH *and* FRITH *of* TAIN.

PETERHEAD, &c.—Two miles N.N.E. ¼ E. from Buchan-ness, upon a low rocky point, is the town of *Peterhead*, which carries on some trade with the Baltic, &c. The harbour is dry at low water, and has a stone pier, which shelters it from the East and S.E.

At eight-tenths of a mile N.E. by E. from Buchan-ness is a rock, always above water, called the *Skerry* or *Calk-inch;* nearly midway between which and the coast is another, that shows only at low ebbs. Between is a depth of 12 fathoms, with clean ground. With steady N.W. winds, vessels may anchor to the southward of the Skerry, in 8 and 9 fathoms.

Three miles and a half N. by E. of Peterhead is *Scotston-head.* Between these places the coast is low, but steep, with from 12 to 14 fathoms close-to; and, at the distance of 3 miles from shore, are 40 fathoms. Off Scotston-head there is a reef, dry at low water, and stretching half a mile out, at the outer end of which are 16 fathoms.

Seven miles north of Peterhead, and 3½ from Scotston-Head, lies *Rattry Head.* The shore between is low and sandy, but has 6 fathoms near it. A ledge of rocks, called *Rattry-brigs,* stretches a mile out from shore, to the eastward of the head, the inner parts of which are dry at low water. To go clear of these rocks, in passing, keep Stirling-hill (heretofore mentioned) on the innermost houses of Peterhead, or the point of Buchan-ness without the easternmost houses of the same. It may also be avoided, by keeping Mormount in sight above the land of Rattry-Head, and not approaching nearer than in 13 fathoms, which will be at the distance of about a mile: or by keeping the lighthouse on Buchanness S.S.W. ¼ W.

RATTRY to KINNAIRD'S HEAD, &c.—*From Rattry-brigs,* the courses and distance to Kinnaird's Head are N. by W. ½ W. and W.N.W. 8 miles; to the Ord-head of Caithness, N. by W. ½ W. 6 miles, and N.W. ¾ N. 60 miles; to Clythe-ness, N. by W. ¾ W. 61 miles; to Noss Head, N. by W. 66 miles; to Duncansby Head, N. ½ W. 74 miles; to the Pentland Skerries, N. ¼ W. 73 miles; to Copinsha, Orkney, N. ½ E. 83 miles: to Fair Isle, N.N.E. ¼ E. 112 miles; and, to Sumbro' Head, the South point of Shetland, N.E. by N. 133 miles.

The little fishing-town of *Carnbulg* lies 5 miles N.N.W. of Rattry Head, and 2 miles S.E. of Kinnaird's Head. The Carnbulg-brigs, or rocky reef, nearly dry at low water, stretch three-quarters of a mile from the point at the east side of the town. They are steep-to, with 10 and 12 fathoms close to them.

KINNAIRD'S HEAD, which lies from Rattry-brigs, as above mentioned, has a castle and lighthouse on it,[*] which may be seen, in clear weather, from the distance of 12 or 14 miles. On the east side of the head is the tide-haven of Frasersburg, and, 9 miles W.N.W. from the head, lies another remarkable promontory, called *Troup Head,* composed of high perpendicular cliffs. Without this head, at the distance of a cable's length, is a small reef, which has one rock always above water.

Eight miles W. by N. from Troup Head, and 17 miles from Kinnaird's Head, is the tide-haven of *Banff.* The small port of Macduff lies a mile east of Banff; on the eastern side of which, at a mile from shore, is a rock called the *Collie,* dry at half ebb, but with 12 and 14 fathoms close to it.

Five miles W.N.W. from Banff is the little tide-haven of Portsoy, to the westward of which lie the *Skate rocks,* on which several vessels have been lost. They lie but a little way out from the shore.

The point called Scarnose, lies W.N.W. ¼ W. 27 miles from Kinnaird's Head, and N.W. by W. ½ W. 18 miles from Troup Head. There is a small rocky reef off this point. *Logie Head* lies 2 miles S.E. of Scarnose; and in the bottom of the bay between, is the town of *Cullen;* a little in-land to the southward of which are three hills, called the *Hills of Cullen,* which are the highest hills near the shore on this coast.

COWSY POINT, the western point of Spey Bay, lies 12 miles W.N.W. of Scarnose. It makes, at first, like an island. The coast in the bay between is low, and the depths moderate, from 7 fathoms within to 14 without, clean ground. On the west side of Cowsy Point are a number of rocks, called *Halliman's Scars,* mostly above water, and reaching a mile from shore, with from 12 to 14 fathoms close to them. Seven miles W. ¾ N. from Cowsy Point, lies *Burgh Head,* remarkable for being lower than the land to the eastward, but terminating in a high cliffy point.

West of Burgh Head, at a distance of 5 miles, is the small tide-haven called *Findhorn.*

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[*] See the note on the Bell-rock lighthouse, page 110. The light on Kinnaird's Head is a fixed or stationary light, and was much improved in brilliancy and effect in 1827. The tower is of stone, 57 feet in height, and situate in latitude 57° 41′ 51″, long. 2° 0′ 6″ W. It is seen from all points between W.N.W. northerly to S.E. The light is 120 feet above high water of spring tides, and may be seen five leagues off.

There is a sandy bay between, and the shore is flat. Four or five miles westward are a number of sand-hills.

Fort George lies 15 miles west of Findhorn, and 20 miles W. ½ S. from Burgh Head. The shore from Findhorn is low and sandy, and the tide ebbs far out, particularly at the distance of 4 or 5 miles to the east of the Fort, at which part the *Whiting Sand* stretches out to a great distance from the shore.

A bank, called the *Middle Ground*, lies to the N.W. of the Whiting, with the Fort Point bearing W.S.W., and on the south side of the channel. It stretches out from near the Fort Point, 2 or 3 miles, having only from 6 to 12 feet on it at low water, with a narrow channel between it and the Whiting. The north shore is steep and rocky.

CROMARTY lies 6½ miles N. by E. from Fort George, and has an excellent harbour: its entrance is nearly a mile wide, the water from 35 to 22 fathoms; and the shores, excepting the south point, clean. Close to the south point lies a small rock, called the Shur; excepting this rock, there is nothing to fear in the entrance. Within the harbour, you may shoalen your water to what depth you please, on either side, but the best anchoring is on the south side, just within the entrance, in 7 or 8 fathoms of water. From this anchorage, up to Inver-brecky, is 5 miles N.W. by W. ½ W.; and you will have more than 12 fathoms of water: in the next 5 miles, the water shoalens gradually, to no more than 5 fathoms. The town of Cromarty stands on the S.W. side of the entrance of the harbour.

In sailing between Kinnaird's Head and Fort George, it may be observed, that, the light on Kinnaird's Head to the westward of W.N.W. will lead clear of the Carnbulg-brigs. In sailing from Peterhead, in the night, steer N.N.E., till the light above mentioned bears N.W., and then N. by W. ½ W., until the light comes to the westward of W.N.W. as above. You may then haul to the westward, approaching no nearer than 16 fathoms, as Kinnaird's Head is steep-to, and the shore is bold thence to Troup Head.

In sailing along shore, between Troup Head and Scarnose, be careful to give the Collie-rock a sufficient berth, as also to the Skate-rocks, west of Portsoy. In the bays between Troup Head and Scarnose, small vessels may anchor with off-shore winds. There is also good anchoring in Spey Bay, in clean ground, all over.

If turning to windward, in the night, between Kinnaird's Head and Cowsy Point, go no nearer to the shore than 18 or 16 fathoms.

From Halliman's Scars to Cromarty the course is W. by N. ½ N. 22 miles. The shore west of Burgh Head is flat and sandy, and in Burgh Head Bay the bottom is clean.

Vessels bound hence to *Fort George* must keep the north shore on board all the way upward from Cromarty, excepting only abreast of three burns or brooks, that run down from the north side, where there is a narrow reef, of 2 fathoms at low water, that stretches a cable's length from the shore. The coast here is high and rocky.

The courses and distance from Kinnaird's Head to Cromarty are N.W. by W. ½ W. and W. by N. ½ N. 63 miles. The shore on each side of the entrance is high, and the latter appears, when sailing from Burgh Head, as a gap in the land.

The high points, one of which will be seen on each side of the entrance of the harbour, are called the *Suters of Cromarty*, and are bold-to, excepting a small reef that extends a ship's length from the West Suter. Between are unequal depths, 12 to 30 fathoms, rocky ground.

Cromarty is situated on a low point within the West Suter. The little bay to the east of the town is shoal to the distance of half a cable's length out. The mark for clearing it is, the south end of the wood, near the houses of Inverbrecky, kept open to the north of Cromarty Point. This point is very steep, and there are 20 and 22 fathoms between it and the ferry-house on the opposite side. In sailing in, keep in mid-channel till round the point; then steer about a mile to the westward along the south side, and anchor in 6 or 7 fathoms; in this depth the marks are, a deep gully in the south shore up and down, and Cromarty Point E.S.E.

Without the harbour of Cromarty, at the distance of between 3 and 4 miles to the eastward of the East Suter, is a reef, dry at low water, and called the *Three Kings*. It lies a mile from shore. To clear it, keep a remarkable house,* on the rising ground south of Cromarty, open without the East Suter.

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* Now, or formerly, Captain Mackenzie's.

TARBETNESS lies in latitude 57° 50′ 50″, and longitude 3° 48′ 25″ W., at N.W. ½W. 58 miles from Kinnaird's Head, and N.E. ¼E. 12 miles from the East Suter of Cromarty. The shore between it and the Three Kings is rocky and flat. East, a mile from the ness, is a sunken rock, called the Culloden, having only 9 feet over it. Tarbetness is likewise generally foul.

To the N.W. of Tarbetness, the *Frith of Tain* is shoal to a great distance from shore; strangers should not, therefore, approach too near. Thence to the Ord Head, the coast is rocky, having several reefs lying a good way out.

A LIGHT-TOWER on TARBETNESS was first lighted on the 29th of January, 1830. Its lantern is open or glased seaward from S.W. ½ W. to W. ½ N., and is elevated 175 feet above the mean level of the sea. The light, in clear weather, will be seen at the distance of 5 or 6 leagues, and at lesser distances according to the state of the atmosphere.

By compass, the lighthouse bears from the sunken rocks called the Three Kings and the King's Sons, N.E. ¼ E., distant nine miles; from Halliman's Skars, lying off Covesea or Cowsy Point, N.N.W. ½ W. 18 miles; from Clytheness S.W. by W. ½ W. 31 miles; and, from Culloden Rock, W. by S. one mile.

The light is intermittent; suddenly appearing like a star of the first magnitude, and continuing in view 2½ minutes, when it suddenly becomes eclipsed for half a minute; thus producing its characteristic effect once in every three minutes.

But, within the Moray Frith, in a south-westerly direction from Tarbet-ness, where the light cannot be mistaken for any other on the coast, it is *permanently* visible, until the mariner pass within a line between Tarbetness and a point half a mile seaward of the King's Sons, when it will be intercepted from his view by the high land of the coast. The interception of the light by the land will thus form a direction for avoiding these dangerous rocks.

The **ORD of CAITHNESS,** or ORD HEAD, is a high, steep, and cliffy, headland, lying N.E. ½ E. 18 miles from Tarbetness, and N.W. ¾ N., 58 miles from Kinnaird's Head. From the Ord Head to Clytheness, the course and distance are E.N.E. 14 miles. The coast is rugged, but flat to a short distance, and between the two points are seen the village of Berrydale, Burg Head, Dunbeath, Lathron Kirk, and Forse Castle.

From CLYTHENESS TO NOSS HEAD, the courses and distance are N.E. by E. and N.E. ½ N. 11 miles. A mile south of the head is Staxigo, a small tide-haven; and a mile and a half farther south, the small port of *Wick,* which is the last town of any consequence on the east coast of Scotland.

SINCLAIR'S BAY, which lies to the northward of Noss Head, has clean ground and moderate depths, wherein vessels may anchor with off-shore winds; as they may also in Freswick Bay, which lies 7 miles N.N.E. from Noss Head.

DUNCANSBY HEAD lies N.N.E. ½ E. 10½ miles from Noss Head, and N. ½ W. 67 miles from Kinnaird's Head. The shore between it and Noss Head is rather bold and rocky. The latitude of this headland is 58° 39′; and, at three quarters of a mile to the southwestward, from its N.E. extremity, is *Duncansby Castle* or *John o' Groat's House,* a high rock, detached from the shore, seen from sea, in clear weather, at the distance of four leagues.

DUNCANSBY HEAD to DUNNET HEAD.—On the south shore of the Pentland Frith, at the distance of 5¼ miles N.W. ½ W. from Duncansby Head, is the rocky promontory called St. John's Head; the greater part of the coast between is foul. At six miles N.W. ¾ W. from St. John's Head is the bold promontory called *Dunnet Head,* on which now stands a lighthouse, built of stone, 45 feet high, situate on the northern extremity of the main land of Scotland. It was first lighted on the 1st of October, 1831. The light is brilliant and *fixed;* and, being elevated 346 feet above the mean level of the sea, it may be seen, like a star of the first magnitude, at the distance of 7 leagues, and at intermediate distances, according to the state of weather. The arc of light is from S.E. ½ E. northerly to West.

From the north end of the isle of Stroma, in Pentland Frith, the lighthouse bears W.N.W. ½ W., 8 miles; from Hoy Head S.S.W. 13 miles; and from the Sule Skerry S. by E. ¾ E., 32 miles.

From the surveys of Mr. Thomas, it appears that his station on Dunnet Head was in latitude 58° 40′ 21″ N., and longitude 3° 21′ 44″ W. The lighthouse is about 1200 feet northwesterly from this station.

On **CAPE WRATH or RATH,** the N.W. point or headland of Scotland, is a light-tower of the first class, of which the lantern or light-room is elevated 400 feet above the level of the sea.

The light is a *revolving light,* exhibiting from one and the same lantern a light of the natural appearance, alternating or changing with one tinged *red;* which two kinds of light successively attain their most luminous effect every two minutes, and thereafter becoming gradually less luminous, are to a distant observer totally eclipsed for a short time.

The brilliant light will, in clear weather, be seen like a star of the first magnitude at the distance of 8 or 9 leagues, and at lesser distances according to the state of the atmosphere; but the *red* light, being somewhat obscured by the coloured shades, will not be seen at so great a distance. (*Official notice.*)

During a gale from the N.E., with a tremendous swell of sea upon the coast, the resident inspector and artificers employed on the erection of Cape Wrath Lighthouse, observed on the 21st of November, 1827, waves breaking very high, at about half-tide, upon the *Nun Rock,* situate five leagues N.N.E. ¾ E. from the cape. This reef extends about one league S.S.W. and N.N.E., and on some parts of it are not more than 2½ fathoms at low tides.

The PENTLAND FRITH *and* ORKNEY ISLANDS.

Vessels bound from Buchan-ness to the Pentland Frith, from the distance of 3 or 4 miles without Peterhead, should steer N.N.E. 9 miles; or until the lighthouse on Kinnaird's Head comes to the westward of N.W. This will lead clear of Rattry Brigs. The course and distance to Duncansby Head will then be N. ½ W. 24 leagues.

With a scant wind, you may steer a little more to the north than the course above mentioned; with an easterly wind, and a sea, you may stand nearly north; lest, after falling to leeward, you should be compelled to make for Cromarty, and lose the advantage of a wind.

THE PENTLAND SKERRIES, on which are two lighthouses, heretofore mentioned,* lie 3 miles E. by N. from Duncansby Head. The lighthouses stand upon the *Great Skerry,* in latitude 58° 42′, and longitude 2° 55′ W. They stand N.N.E. and S.S.W. with each other, 60 feet distant, and exhibit brilliant fixed lights, respectively at 140 and 170 feet above the level of high water, spring tides; seen all round the compass at from 16 to 18 miles off. *Variation,* 29° 45′ W. in 1830. High water, full and change, at 8h. 30m. *a. m.* Springs rise 8 and neaps 3½ feet.

The bearings and distances of the most conspicuous head-lands from the lights are as follow: The Island of Copinsha, N.E. by E. ½ E. 15 miles; Roseness Head, which forms the east side of Holm Sound, N.E. ½ N. 11 miles; the east end of Burra, N.E. ¾ N. 10 miles; Halcrow Head, of South Ronaldsha, N.N.E. ½ E. 4 miles; and Barth Head, the western head of that island, W. ½ W. 3¾ miles. Between this head and the light-houses lies the Loather Rock, 3 miles from the light.

The south end of the Island of Swona bears from the lights N.N.W. ¾ W. 5 miles; Brimness, the S.W. point of Hoy-waes, N.W. ½ W. 11 miles; the north end of the island Stroma, N.W. ¾ W. 6 miles; Duncansby Head, W. by S. 3¼ miles; Noss Head S.W. ¼ S. 12 miles; the Little Skerry, South, one mile; and the outer rock of the foul ground, S.E. by E. 1¾ mile.

PENTLAND FRITH. *The passage through Pentland Frith* is either between Duncansby Head and the Island Stroma on the south side, or between Pentland Skerries and the Island Swona on the north side. That to the northward of Stroma is generally preferred. From Duncansby Head, the Great Skerry lies as above mentioned; the north end of Stroma N. by W. 4½ miles; and the south end of Swona N. by E. ¼ E. 5¾ miles. From the south end of Swona, the north end of Stroma bears S.W. by W. ½ W. distance 2¾ miles, and the Skerries' lights S.S.E. ½ E. 5 miles. Your course from the entrance of the Frith to a fair berth between Stroma and Swona, is N.N.W. 5½ miles; and thence to the westernmost part of the Frith, between Dunnet Head and Hoy Island, N.W. by W. ½ W. 9 miles.†

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* See the note on the Bell-rock lighthouse, page 110.

† The Chart of the Orkney Islands, published by Mr. Laurie, will here be found extremely useful, as it exhibits all the tracks, the set of the tides, the bank called the *Nun Bank,* &c. with an explanatory observations.

In going through Pentland Frith with a neap-tide, the stream is generally so weak, that it need not be regarded, unless there happens to be little wind: although the spring-tides, when strongest, run 9 miles in an hour, and their strength, direction, and time of running, ought to be particularly minded in shaping your course. As the ebb-tide sets to the northward, and the flood-tide to the southward, it is necessary that you should, in going to the westward with an ebb-tide, keep nearer to Duncansby and Stroma than to the Skerries and Swona; and, in proceeding to the eastward with a flood-tide, you should keep nearer to Swona than to Stroma, unless the wind be scant in the southern quarter; in which case you should pass close by Stroma, to enable you to weather the Pentland Skerries.

As the tide runs nearly three hours longer in the middle of the Frith than it does on the sides, ships, in passing through it, ought to avail themselves of that difference; if, for instance, when you come into the Frith from the southward, you find that the flood-tide is against you, your best way will be between the Caithness shore and Stroma Isle. In going through this passage, you should remember that, at a cable's length S.S.W. from the south-west point of Stroma, lies a small rock, which appears at about half-ebb; and that, from St. John's Head, in Caithness, a ridge runs off N.N.E. for a quarter of a mile. If the tide proves unfavourable before you get through this passage, anchor in Gill's Bay, to the eastward of St. John's Head, on clean ground, and out of the tide-way.

The ledge, which lies off St. John's Head, is called the *Men of Mey*. A very strong tide sets over it at half-ebb.

As the tide, on its coming within a quarter of a mile of the middle of Stroma and Swona, divides into two branches, which, after passing their north and south ends, run to a considerable distance beyond the islands before they join again, ships, that do not get through the Frith before the tide runs against them, may be kept under way in the eddies; or they may, with a flood-tide, anchor on the east side of Stroma and Swona. Half a mile off the middle of Stroma Isle are 16 fathoms of water; the bottom a mixture of sand and shells. This eddy extends a mile to the eastward of the island, where the two streams which form it again unite. At a cable's length off the North Haven, on the east side of Swona, you may anchor in from 16 to 20 fathoms of water; the bottom is smooth and rocky; here the water deepens very fast to the eastward. The North Haven is a narrow cove near to the northernmost house on the east side of the island. This eddy extends a mile and a half to the south-eastward of Swona.

There are eddies on the west sides of Stroma and Swona, with the ebb-tide, which are as extensive as those formed on the east sides with the flood-tide, if not more so; but there is no anchoring on the west side of either island. Half a cable's length from the west side of Swona, lies a rock, called the Wester-bow: it is seen only with very low spring-tides.

Near to the south end of Swona with a flood-tide, and near to the north end of Swona and Stroma with an ebb-tide, are whirlpools; but they are never dangerous to ships. From the north end of Stroma, westward, is, during the ebb-tide, always a great swelling sea, and frequently breakers, (even in the calmest weather, called the Swelky of Stroma, which ought to be avoided. From the south end of Stroma, westward, is, with a flood-tide, a rough breaking sea, on the Men of Mey. Off Duncansby Head, there is also a rough breaking sea, with spring-tides, called the *Bore of Duncansby*, dangerous to boats, but never so dangerous as the former.

In PROCEEDING *for* PENTLAND FRITH *from the* NORTH-EASTWARD, approach not to Old Head, on the east side of South Ronaldsha, within less than half a mile; for a rock, called Old Skerry, lies at a quarter of a mile E.S.E. from the Head. You will avoid this rock, by keeping the north kirk of South Ronaldsha, or the house of Cara, in sight, without Halcrow Head. The Loather, before-mentioned, is a rock which lies off the south-west point of South Ronaldsha, and is never covered but at high water; it may then be distinguished by the rippling of the tide, or the breakers on the middle of it. By keeping half a mile from the shore of South Ronaldsha, when going to the westward with an ebb-tide, and a mile from the shore, when going to the eastward with a flood-tide, the streams will carry you clear of it. If you should happen to be so near to the land that you cannot go to the southward of it, you may safely keep the middle of the channel. Between it and South Ronaldsha, the water, though always rough and breaking, even in the calmest weather, is deep enough for any vessel.

Your courses through the Frith, between South Ronaldsha, Swona, and Turness, on the north side, and Pentland Skerries, Stroma, and Dunnet Head, on the south side, are as before-mentioned; but you must always allow for the operation of the tide; the flood to the southward, and the ebb to the northward. If you meet with the flood-tide before you get so far to the westward as the eddy on the east side of Swona, keep under way in Liddle's Eddy, on the south side of South Ronaldsha; or, if there be not sufficient wind to work the ship, you may anchor half-way between South Ronaldsha and the Great Pentland Skerry; the west end of the Great Skerry bearing S. by W. in 17 or 18 fathoms of water; the bottom is a mixture of sand and shells. In keeping under sail in this, and in all the other eddies, be particularly careful not to go beyond its boundary, lest you should be hurried away by the rapidity of the tide, and thereby be prevented from fetching into it again. The boundary is easily distinguished. This eddy, or westward stream, begins before half-flood on the shore, and extends by degrees southward. At the fourth hour of the flood, it spreads half way to the Great Pentland Skerry, and near to the latter end of the tide, approaches to a cable's length of the Skerry.

There is another eddy on the east side of Pentland Skerries, in which you may anchor with a flood-tide; the streams which form it never join again, but open wider as they proceed, until they are lost in the open sea: half a mile S.S.E. from the Little Skerry, are 14 fathoms of water. You may also anchor in this eddy with the following marks, namely, the middle of the Little Skerry on with the middle of the Great Skerry; or the east end of the Great Skerry on with Sandy Hill, on South Ronaldsha; or the west end of the Little Skerry on with the Hill of Hoy; and the east end of the Great Skerry on with the Wart-hill of Orfer. The ground is a mixture of sand and shells. There is also an eddy on the west side of the Skerries, with an ebb-tide; but it is small, not extending above a quarter of a mile from the Great Skerry.

At nearly a mile S.E. from the S.E. side of the Great Pentland Skerry, and three-quarters of a mile E. by N. from the Little Skerry, lies the *Clett*, or *Cleta Skerry;* its top is above the water. Half-way between Cleta Skerry and the Little Skerry, lies *Lotha Skerry;* which appears at half-ebb. The water is shoal all the way between Cleta Skerry and the Little Skerry, though Lotha only appears above the water.

Note. In most of the eddies, especially those on the east side of Stroma and Swona Isles, you must be sure, with a spring-tide to have your anchor up before the ebb begins to run, otherwise you will be obliged to cut or slip your cable, and afterwards find it very difficult to clear the island.

If, from the SOUTHWARD, *you are crossing the east end of Pentland Frith, for Orkney,* with an ebb-tide, you should pass near to the west side of Pentland Skerry, to prevent your being carried by the stream to the westward of Swona, for there the ebb would be against you. In crossing from the north to the south with a flood-tide, you should pass as near to Swona as you can, that the tide may afterward be more in your favour. In crossing the east end of the Frith either way with a flood tide, you should endeavour to get into the eddies of Stroma and Swona, to enable you to make use of the tide with greater advantage.

When you cross Pentland Frith, with the latter end of a tide, allow the stream to carry you as far as possible, for you will thereby reap the greater advantage from the succeeding tide.

The Pentland Skerry lights are useful to vessels coming in from the westward; as, when a ship is in the fair-way, keeping them on the larboard-bow, or on the larboard side, they will lead clear to the S.S.E. into the North-Sea.

GENERAL REMARKS ON THE ORKNEY ISLANDS.—The Islands of Orkney extend about 42 miles from North to South. They are of irregular height; and, although the headlands of some are high and prominent, others are equally low and undistinguishable; for, in these regions, the air is, during a great part of the year, thickened by fogs; and a clear atmosphere is never, for any continuous length of time, to be expected. The land to the northward is the lowest; particularly the islands of Sanda and North Ronaldsha, the land of which can be seen at only a short distance; and these are the more dangerous, as the gales of wind, in the winter especially, are tremendous beyond description.*

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* Upon Dennis-ness, the northernmost point of North Ronaldsha, is a beacon of stone, surmounted by a ball of masonry, eight feet in diameter, latitude 59° 24', longitude 2° 30' W. The top is 70 feet above high water, spring-tides, and may be seen 13 miles off.

For a General Description of the Orkney Islands, see our 'MEMOIR and DIRECTIONS for the NORTHERN OCEAN,' &c. p. 66.

Those who come from the N.E. should understand that the high-light of the Pentland Skerries may be seen nearly seven leagues off; as may also the light on the Start Point of Sanda, and that of Kinnaird's Head. Caution should therefore be observed that one of those lights be not mistaken for another.

EAST SIDE of ORKNEY.—From Old Head, the S.E. point of South Ronaldsha, to Copinsha Island, the bearing and distance are N.E. by E. ½ E. 13 miles; and from Old Head to Grimness N.E. ½ N. 5 miles. *Old Skerry* extends, as before-mentioned, a quarter of a mile E.S.E. from Old Head.

Halcrow Head lies 1¼ mile N.E. by N. from Old Head. Between Halcrow Head and Grimness, off the middle of the bays of Lyth and Windwick, you may anchor on clean ground, keeping Roseness in Holm, on with, or rather a little without, Grimness. Between Halcrow Head, and Grimness, the tide, during the first four hours of flood, runs to the northward, and from that time to the last of the ebb, the stream runs to the southward.

N.E. ¼ E. 3½ miles from Grimness, is Roseness, the south point of Pomona: between lie the entrances of Water Sound and Holm Sound, which are dangerous in an easterly gale and flood-tide; particularly Water Sound. The latter lies between Grimness and the Island of Burra, and Holm Sound lies between the N.E. point of the Island Burra and Roseness. Between Grimness and the entrance of Water Sound, you may anchor on clean ground, half a mile from shore.

The ISLAND *of* COPINSHA extends a mile N.E. and S.W., and is half a mile broad. On the south side of this island, a vessel may stop a tide, half a mile from shore. Half a mile to the N.N.W. of this island, is an islet, called the Horse, with three fishing-beacons on it; and, about half-way between Copinsha and the Horse, is a small sunken rock, on which are only 9 feet at low water, spring-tides: you will avoid it, when going through this channel, by keeping to either side, but rather toward the Horse, as there is deep water within twenty yards of that island. As there is a flat extending about a cable's length to the westward, from the westernmost of the Holms of Copinsha, and a rock, lying a quarter of a mile to the eastward of the point of Air, which is visible only at low water, spring-tides, those who go through this channel will avoid shoals on each side, by keeping a third of the distance from the Holms, and two-thirds from the point of Air. In this passage are 3 fathoms at low water.

In passing along the east side of Dearness, keep more than half a mile from the shore; as a flat stretches off from the Kirk of Dearness, half a mile to the E.S.E., which is dry with spring-tides. A little to the northward of the outer end of this flat, and S.E. from Sand side, lies a rock dry at half-ebb.

Mould or Mull Head, the east point of the entrance of Dear Sound, lies 3¾ miles N. ½ W. from Copinsha Island; Auskerry Island bears from Copinsha N.E. ¼ E. distant 6½ miles; and Fair Isle E.N.E. 17 leagues.

A quarter of a mile E.N.E. from the northernmost part of Auskerry, lies a sunken rock, on which there are only 6 feet at low water; and at a cable's length from the N.W. part of the island, are three small rocks, two of which are always visible. At a mile N.E. by N. from the N.W. part of Auskerry, and three-quarters of a mile from the shore, lies a rocky shoal, called Ingald; it appears at two hours ebb: between the west end of this shoal and the shore, it almost dries with low spring-ebbs. Those who go through, between Auskerry and Stronsa, should keep in the middle of the passage, and they will avoid the dangers on both sides.

ROUSHOLM BAY, on the south side of Stronsa Island, has clean ground, and a convenient place to anchor in; nearest to the west side of the bay is the safest in the winter-time. Mill bay, on the east side of Stronsa, has also clean ground, and is convenient to stop a tide in. Off Rousholm Bay, and between Auskerry and Stronsa Islands, the stream, during the first three hours of flood, runs to the eastward: and from that time until low water, it runs to the westward.

About 2¼ miles N.E. ½ E. from the south-east part of Auskerry Isle, is Lamb Head, the south-east point of Stronsa Island. This head is remarkably high, as well as the next Head to the northward, called *Burrow Head*. From the latter, the Start Point of Sanda lies N.E. 11½ miles.

ODNESS lies about a mile and a half N. by E. from Burrow Head; and half a mile

N.

N. by E. ½ E. from Odness lies a rock called the *Boa*, which appears only at spring-tides. By keeping Burrow Head without Odness, you will go clear of it on the east side: and, to go clear of it on the north side, when going into Mill Bay, keep half way between Odness and Griceness; then steer to the westward, and anchor in 4½ and 4 fathoms of water; the bottom is sand, or sand and shells.

N.N.E. ½ E. 6 miles from Odness, lies Tres-ness, the S.E. point of Sanda. To the N.E. of this point are some rocky shoals, at a mile and a half from the point. Some of them appear at low water spring tides. To go clear on the east side, either in sailing northward or southward, approach no nearer to Tres-ness, than until the easternmost houses of Newark come on with the chapel of Arstas.

THE **START POINT** lies 5 miles E.N.E. ½ E. from Tres-ness, and between is *Newark Bay*, in which you may anchor on clean ground, within half a mile of the shore; but the east and west sides of the bay must be avoided. The best part for anchoring in is off the sand, with the house of Newark W.N.W. distance three-quarters of a mile.

Upon the Start Point, there was erected in the year 1803, a tower of masonry, as a beacon; but this beacon having been found insufficient for the prevention of numerous wrecks which had happened upon the low shores of the island, was afterward converted into a lighthouse, and was first lighted upon the 1st of January, 1806.

By the compass Dennis-ness on North Ronaldsha bears from the Start point N.N.E. ½ E. distant 6½ miles, and the Lamb Head of Stronsa S.W. 13 miles.

The light, *brilliant and fixed*, is visible from every point of the compass, and elevated above the level of the sea, at high-water, of spring-tides, 100 feet; of which height the building forms 90 feet: and, that this light may be distinguished from all others on the coast, the reflectors are made to revolve once in every two minutes, exhibiting light one minute, and disappearing the next, an effect fully sufficient for the purpose; as the light increases from darkness to full strength during one minute; and, during the next, declines in strength to total darkness. The light may be seen at five leagues off.

BRIDES-NESS, the south-east point of North Ronaldsha, lies N. by E. ½ E. 4½ miles from the Start; between lies the east entrance of North Ronaldsha Frith. At a mile and a quarter S.E. ½ E. from Brides-ness, and 4 miles N.E. by N. from the Start, lies the outer edge of the middle of the Reef-dike, extending N.N.E. and S.S.W. three-quarters of a mile each way; and is at its broadest part, nearly half a mile across. This is a sunken rock, which has, on its shoalest part, next to Brides-ness, only 5 feet at low water, spring-tides. There are always breakers on it with an ebb-tide, and often with flood-tide; open vessels can seldom go over it without great danger. Even when the water is smoothest, the rock may easily be distinguished by a dark coloured rippling tide, running along it: the water, in approaching it on either side, shoalens gradually.

In sailing from the westward, between Sanda and North Ronaldsha, with a flood-tide, you should proceed through the middle of the Friths, and the tide, if the wind fails, will carry you to the southward of the Reef-dike. If you have an ebb-tide against you, in going through from the westward, you should keep as close to the shore of Sanda as the flats will permit, for there the stream is weakest, and may be thwarted with great advantage. If you happen to be near the south side of North Ronaldsha, and find that you cannot go to the southward of the Reef-dike, you may safely go through between Brides-ness and the rock, by keeping along two cables' length from the Ness in passing. If, when you are between the Reef-dike and North Ronaldsha, you are doubtful whether you can clear Dennis-ness, especially with a flood-tide, you may tack, or you may come to an anchor in Lincelot Bay, on clean ground, rather than attempt going to the southward of the island, because there the flood runs directly toward and over the shoal.

DENNIS-NESS, on which the North Ronaldsha light was formerly kept, lies 2 miles N.E. of Brides-ness, and 6 miles N.N.E. ½ E. from the Start. About half a mile to the northward of Dennis-ness, lies a rock, called *Selch Skerry*; a small part of the middle of it is always above the water; between this rock and the shore it is almost dry, with spring-tides. *The Altars of Linay*, extend a quarter of a mile to the northward from the shore of the north-west part of the island. Ships, in passing through the S.E. part of Dennis-ness, should give it a berth of about a cable's length. Off Dennis-ness, and thence southward, without the north-end of the Reef-dike, the stream, during the first three hours of flood, runs S.S.W., and from that time, until low water, it runs N.N.E.

A mile northward from Dennis-ness there is, even in the calmest weather, a rough breaking sea with the ebb-tide, which, with spring-tides and westerly winds, is violent. Between this sea and the shore is an eddy, during the flood-tide, in which a vessel may sometimes continue tacking until the tide is done.

The centre of the rock, called the *Reef-dike*, above mentioned, lies 2½ miles from the point of Dennis Ness; the bearings from which are, the N.E. end of the Reef-dike, S. by W. ¼ W. 1½ mile; the S.W. end of the same, S.S.W. ½ W. 3 miles; the Start of Sanda, S.S.W. ½ W. 5 miles; the South end of Fair Island, nearly E. by S., and the North end of the same about E. ½ S., distant 29 miles.

In sailing hereabout, allow sufficiently for the tides, as the ebb sets directly upon the Island of Papa-Westra, and the flood contrary. In steering either to the eastward or westward, allow at least, therefore, half a point for the offing.

WESTERN SIDE OF ORKNEY.—The western points of the Orkney Islands may be more readily distinguished than those on the east, because Hoy Head, before mentioned, will always be the first land made in coming in from the west. Hoy Mouth, the sound or inlet, of which Hoy Head forms the southern point, leads to STROMNESS, an excellent harbour, much resorted to by strangers, and the best for vessels bound out to the west.

The HARBOUR of STROMNESS, in latitude 58° 58′, with its shoal spots, &c. is clearly exhibited in the Charts. The Isle Gremsa bounds it on the S.W., and Mainland on the opposite sides: but, between Gremsa and the latter is a shoal, called the *Riddock Shoal*, which may demand a particular description. This shoal lies off the east end of the Island Gremsa: it extends north and south, and is nearer to that island than the opposite shore of Orfer or Houton Head. It is composed of large rough stones, and is supposed to have been formed in the year 1783, when a violent gale of wind happened, which made the waves so tempestuous, that, in several other parts of the coast, large stones, and fragments of rocks were driven to a distance from their usual places.

The least water on this shoal, with ordinary springs, is 15 or 16 feet at low water.

With extraordinary low tides, there may be no more than 12 or 13.

The leading marks to it are, the Old Kirk at Stromness on with the N.E. point of Gremsa, near Sandside House; and Windbree House (the middlemost of the three farm-houses that stand in a line on the highest part of Gremsa) on with the Keme, or the north-westernmost part of Hoy Head.

To avoid this shoal, in sailing from the South, along the south and east sides of it, keep the Old Kirk of Stromness a sail's breadth open to the north of the N.E. point of Gremsa, till you bring the Keme of Hoy to the westward of Windbree House, the middlemost of the three before mentioned; then steer for the anchorage, at the back of the Holms of Kerston.

In sailing from Hoy Mouth to the northward, the only danger to be feared is a rocky shoal, called the *North-shoal*, which lies upon a bank to the N.N.W. of Marwick Head, and nearly N. by E. ¾ E. 16 miles from Hoy Head. To the S.W. of this shoal lies the entrance of the sound called *Enhallow Sound*, lying between Pomona and the Isle of Rousa, and which takes its name from an island in the middle. There is a fair way through, but the island should be left on the larboard side, and a pilot is required. In case of necessity, you may, however, venture in, by keeping as nearly to mid-channel as possible, or rather more to the island side. A boat may here be had, upon a proper signal.

WESTRA FRITH, which lies between the Islands of Rousa and Westra, is a large inlet, in which there is plenty of room for working; but there is a ridge of rocks, on the Westra side, called the *Skerries of Skea*. To avoid them, it will be proper to tack when half-way over from the western side. The latter is bold, and there is nothing to fear. In the day, and by reference to the Chart before mentioned, vessels may sail from the westward through this place, and out to the eastward, or from the eastward to the westward, without a pilot, by making a proper allowance for tide; observing that the flood sets to the eastward and southward, through the islands, and the ebb contrary.

FAIR ISLE.—This island lies 28 miles E. by S. from Dennis-ness on North Ronaldsha. It extends N.N.E. ½ E. and S.S.W. ½ W. [*North and South true*] nearly 2 miles, and is half a mile broad at its north end. The land of this island is high, and the water within half a cable's length of the shore, deep. The only place where a vessel can moor, and that only in the summer time, is a small cove on the east side of the island, called the North-haven: it is capable of containing only one or two small vessels at a time. Near to the north end of this cove is a rock, always above water, on the north side of which you must make fast. There is a rock on the larboard side going in, which appears, at low water; you must keep in the middle of the passage. The least water in this cove is 12 feet.

This rugged, and apparently inhospitable, isle, maintains a population of nearly 200 persons. The tide sets about it with great velocity, and forms, on the eastern side, a considerable eddy. Notwithstanding these disadvantages, refreshments may occasionally be had here, as fowls, sheep, fish, and eggs, which the inhabitants take off in their boats. For Admiral Krusenstern's description, see our "Memoir and Directions for the Northern Ocean," p. 15. The position of the isle, as lately given by Mr. Thomas, is, the highest point, latitude 59° 32′ 54″, longitude 1° 37′ 50″ W.

The ISLANDS *of* SHETLAND.

The principal points of Shetland, &c. as lately gained on the Survey by Mr. Thomas, one of the most eminent surveyors of the British navy, are as follow:—

	Latitude.			Longitude.			
	°	′	″	°	′	″	
Foul Island; the summit	60	8	28	2	5	40	W.
Sumbro' Head; lighthouse	59	51	20	1	16	27	—
Lerwick; flagstaff of the fort	60	9	22	1	8	41	—
Brassa Island; the summit	60	7	51	1	5	49	—
Whalsey Island; the summit	60	20	1	1	0	22	—
Out-Skerries; Brury Isle	60	25	41	0	45	2	—
Reafirth Kirk, in the Isle of Yell	60	35	55	1	3	46	—
Fetlar Island; the summit	60	37	12	0	51	56	—
Balta Island; the middle of the East shore	60	41	3	0	47	17	—
Ve Skerries, off St. Magnus' Bay, on the West	60	22	30	1	49	10	—

SUMBRO' or SUMBURG HEAD, the S.E. point of the Main-land of Shetland, lies N.E. by E. 20 miles from Fair Isle. It is now distinguished by a conspicuous and important lighthouse, constructed under the order of the Commissioners of the Northern Lighthouses, and first lighted on the 15th of January, 1821.

The following is a specification of the position of the lighthouse, and appearance of the light, by Mr. Stevenson, Engineer to the Commissioners.

"SUMBURG HEAD LIGHTHOUSE is situate on the southern promontory of the Main-land of the Shetland Islands, in north latitude 59° 52′, and west longitude 1° 15′.* The lighthouse, by compass, bears from Hangcliff Head, in Noss Island, S.W. by W. distant 21 miles; from Fair Island, N.E. by E. distant 21 miles; and from the island of Foula, S.S.E. ½ E. distant 30 miles. In reference to these bearings, the light will be visible to the mariner from the southward between Noss and Foula Islands.

"This light will be known to mariners as a stationary light, from oil, with reflectors; and, being elevated 300 feet above the medium level of the sea, it will be seen like a star of the first magnitude, at the distance of 6 or 7 leagues, and from intermediate distances, according to the state of the atmosphere."

On this light, the following remarks have been made: "The commissioners, under whom this elegant building has been erected, have doubtless proceeded on the best evidence in choosing this place; but the situation is, unfortunately, too high. In the thick weather, so common in Shetland, particularly with easterly winds, this lighthouse must always be involved in mists and fogs; and, even in the ordinary westerly winds, it arrests the flight of the clouds. It is to be feared that the light will frequently be invisible, and particularly when it is most wanted; and that it will thus become an *additional source of danger*, rather than of security. There is, unfortunately, no lower point at the southern extremity of these islands, where it could have been built, so as to serve the purposes of ships coming from the eastward as well as the westward; but many seamen give a preference to Mousa

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* Mr. Thomas, as shown above, makes the position 59° 51′ 20″ N. and 1° 16′ 27″ W.

Island, as the chief want is that of a night-mark for vessels intending to make Lerwick. Such a lighthouse, together with a small light on the Nab, would render that harbour accessible even in the darkest night."—*Dr. J. M'Culloch*, 1822.

THE ISLANDS OF SHETLAND are similar to those of Orkney, but are more steril and desolate. A scientific writer, Professor Jameson, says, "On viewing these islands in general, a wonderful scene of rugged, black, and barren, rocks presents itself to our view: no tree or shrub is to be seen, to relieve the eye, in wandering over these dreary scenes. Sometimes, however, a few scanty portions of cultivated ground catch the eye of the traveller, exciting emotions of pleasure, and forming a striking contrast to the barren heath-covered mountains which skirt them. The western part presents many scenes as wild and steril as can be conceived; gray rocks rising from the midst of marshes or pools, and shores bounded by awful sea-beaten precipices, do not fail to raise in the mind ideas of desolation and danger.

"The coasts are, in general, rugged and precipitous; presenting, in many places, scenes truly grand and impressive, vast rocks of various heights, dreadfully rugged and broken, opposing their rude fronts to all the fury of a tempestuous ocean; which, in some places, has formed great detached pillars; in others, has excavated grand natural arches and caverns, that mock all human magnificence, and strike the beholder with that awe and wonder, which must affect every one on viewing these amazing wrecks of nature.

"The eastern side of Main-land and the other isles is comparatively low, but the western lofty and rugged. This is well known to be the case with most mountains and islands. The hills in Main-land run in three ridges, from North to South; they are generally round, and of little height. RONAS, the highest, stands detached in the N.W. corner of Main-land."

The climate of the Shetland Isles is variable. The atmosphere is, in general, moist. There are heavy snows, but they seldom lie long on the ground, as the frosts are not severe. Dreadful storms, of wind, rain, and thunder, are frequent, and so violent that the water seems to be agitated even to the bottom of the sea.*

For a farther and more particular description of Shetland, see our 'Memoir and Directions for the Northern Ocean,' &c. pages 68 to 71.

The islands of Shetland have been regularly and scientifically surveyed; but, as the tides and currents have never been correctly investigated, the utmost caution, in navigating the coasts, is required. In some of the channels the velocity of the stream often reaches to 5 or 6 miles an hour, and at times even to more.

To a stranger making any harbour, it is essentially requisite to have some peculiar or picturesque marks by which the spot can be recognized under different positions, or under that position, at least, in which it is most likely to be seen.

As, in leaving a harbour, every one has an opportunity of ascertaining the state of the tide, it is unnecessary to point out the peculiar situations in which it is necessary to possess this knowledge for that purpose; but it may be remarked generally that, with respect to the making a great proportion of the harbours, a vessel may often fail in its object, unless that circumstance is previously well known, and thus be compelled to stand out to sea again.

QUENDAL BAY, &c.—FITFILL HEAD, which lies 3½ miles to the N.N.W. of Scantness, the south end of Shetland, is a high promontory, within which lies the bay called QUENDAL BAY, and without it is the isle called *Cross Island*. This is a wide and excellent bay, even in winds from the West; nor is there any difficulty in getting to sea should the wind shift to the southward, unless there be a very heavy swell; as it is sufficiently wide to enable a vessel to beat out without difficulty. You may run in by steering N.E. between Cross Island and Fitfill Head, and then anchor in 8 fathoms on the west side, safe from all but S.S.W., S.W., and W.S.W. winds. The passage between Cross Island and the eastern shore is foul and dangerous.

WEST VOE, between Sumbro' Head and Scantness, (off which is an islet,) is more spacious than is commonly represented. Here is anchorage in 7 or 8 fathoms; and this anchorage may often be convenient with an East wind, or with a wind from the West, when Quendal Bay would be too open. The ground is clean and good, and there is no difficulty in beating out, unless the wind happens to shift to the southward.

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* In No. 22 of the *Nautical Magazine*, Dec. 1833, is a letter on the 'superstitions of the Shetland Islanders,' interspersed with some descriptions and remarks on the climate, which are curious and interesting.

SUMBRO' HEAD, NORTHWARD.—The inlets immediately north of Sumbro' Head, namely, *East Voe* and *The Pool*, are both exposed and shoal; nor are they safe even for the smallest class of fishing vessels, although some may, in summer, be seen here.

From Sumbro' Head to Mousa Island, the course and distance are about N.E. by E. 10 miles. About 8 miles to the north-eastward is an inlet, a mile wide, in which are two bays called *Levenwick* and *Sandwick*, where vessels may ride in 7 or 8 fathoms of water, but much exposed to the East. Within Mousa Island is a small inlet, called Aith's-voe, but it has not more water in it than 10 or 12 feet.

From Mousa Island to Bressa Head, the course is N.E. ½ E. 9 miles. The entrance of Bressay Sound is readily known by the islands Bressay and Noss; the former is remarkably high in the middle, and slopes to the westward; but, to the eastward, it ends with a perpendicular cliff. The Isle of Noss has an acclivity from the west toward the east, and terminates with a high cliff that hangs over the sea, and therefore is called Hang-cliff. Its situation is in lat. 60° 8′ N., and long. 1° 5′ W.

LERWICK, the principal village of Shetland, is situate on the western side of Bressay or Brassa Sound, and contains about 1800 persons. Two packets, or traders, having good cabins, and tolerable accommodations, sail occasionally between this and Leith. The town derives its chief support from the courts of law, and from the vessels employed in the whale and herring fisheries, making this harbour their rendezvous. Near the north end of the town stands Fort Charlotte, mounting eighteen large guns, &c.

The sound is clean, from side to side, and the water deep. If bound to Lerwick, you may run without fear, into the Sound, with Bressay on your starboard side. Advance thus until you open Lerwick; then steer N. by E.; after which you may run up and anchor any where before the town or fort in 8 or 10 fathoms of water. This harbour is well sheltered from all winds, has good anchorage, and is sufficiently capacious to contain a large fleet of ships of war; but, it is to be observed, that the passage out to the northward, called the North Sound, is very narrow, and has, in some parts, not more than 2½ and 3 fathoms at low water.

The projecting points of the Sound are some of them foul; but, these being avoided, you will go up safely to the anchorage as above. However, if bound out to the northward, it is necessary to observe, that you should not venture without a pilot. For sailing out this way, the directions are, to keep Main-land on board, which is bold, until you have passed the little isle called *Cruister Holm;* because, in mid-channel without that holm, there is a sunken rock, called the *Loofabar*, which lies N.N.E. of the castle, with the Holm of Cruister E. by N.

Having passed the Loofabar, you will find, in the first narrows, a sort of bar of 3 and 2½ fathoms. In sailing through this part, it is best to keep toward the main. When through this, you have another strait to pass, still narrower than the former. Here you must keep close to the westward, near to the little isle called Scotland, to avoid a ledge that stretches out from Bressay. In this part are three fathoms. When clear of these dangers, you may steer out E. by N. or E.N.E. to sea, between the islets called Boester and Green Holm, leaving some sunken rocks, which lie off the latter, on the larboard side.

The ESTUARY between the GREEN HOLM and MULL of ESWICK forms the entrance to four other good harbours: of these, the southernmost is called *Deal's-voe;* the next Laxfrith-voe; then Wadbester-voe, and Catfrith-voe. They are all clean, and have good anchorage. The estuary or inlet lies between Kirkbuster on the south, and Glitness Isles on the north, side.

There is a half-tide rock, called the Toagrode, about three-quarters of a mile N.N.E. from Kirkbuster Point; you must, when going in, keep over toward Glitness Isles, on the north side of the inlet.

DEAL'S-VOE lies in S.W. by W. 1½ mile; in this voe you may anchor in 10, 8, 6, or 5, fathoms: the water shoalens gradually as you go up. Laxfrith-voe lies nearly W.S.W. or S.W. by W.; the depth of water in it is much the same as in Deal's-voe. Wadbester-voe lies nearly west; you may anchor in it from 7 to 3 fathoms of water. Catfrith-voe lies in from N. to N.N.W. This is far superior to the rest, and you may anchor all over it, in from 7 to 4 fathoms of water. This voe will contain upwards of 100 sail.

Vessels coming in for these voes from the northward, and having passed the Out Skerries, should haul in S.W. by W. for Rumble Isle; then W.S.W. 7 miles toward Eswick-mull, which will lead you between the *How-stack*, a round islet, and the *Green Holm*. These objects are a mile and a half distant; and between are 40 fathoms of water, clear on either side. Now haul up for the Glitness isles, which lie near the main, and apparently joined to it, by which you will avoid the Toagrode, above-mentioned.

At 5½ miles to the northward of the Mull of Eswick is the entrance of *Oure Voe*, which is a mile wide and open to the East. On the southern side within is an islet, *Ballesetter Holm*, and there is a rocky shoal of 9 feet water between this holm and the southern shore. Opposite to Oure Voe is the Island Whalsey, and a cluster of islets.

N.E. ½ E. 18 miles from Noss Head, or Hang Cliff, lies the outermost of the *Out-Skerries*, and from the Out-Skerries to the east end of Fetlar Isle the bearing and distance are N. by E. 12½ miles.

The water, on the east side of the Shetland Isles, is very deep; from 120 to 150 fathoms, within two leagues of the shore: in 35 or 40 fathoms, you will not be more than one league from the shore.

The OUT-SKERRIES, which lie 6 miles to the north-eastward of Whalsey, form a harbour for small vessels, but it cannot be taken without an accurate knowledge of the time and nature of the tides, owing to the shallowness and intricacy of the channels.

BALTA SOUND, &c.—The northernmost island of Shetland is that named UNST, distinguished by the useful harbour named Balta Sound, of which a particular plan is given on our Chart. Unst is about 5 miles long, and 2½ broad. A hill, called *Vallafield*,[*] rises at something more than a mile from its northern extremity, and extends, parallel to the western coast, to the very northern point. It is 600 feet high. At right angles with this hill stands *Crossfield*, nearly in the middle of the island. To the north stands *Saxaforth*, which is 700 feet high: this is the highest in the island, and may be seen 40 miles off: a hill called *Verde Field*, extends in a parallel direction with the eastern coast. Among these hills are tracts of level fertile ground, and the highest hill is covered with black moss.

The headlands rise to the height of 60 or 70 fathoms, but the shores of the bays are low and sandy. Around the coast are several curious natural caves; and, under an arm of the hill Saxaforth, is a magnificent natural arch, 300 feet long, and of considerable height, through which a boat may be rowed.

Balta Sound, in lat. 60° 45′, is nearly in the middle of the island, on its eastern side. Before its entrance is the narrow island, named *Balta*, and which shelters it from all winds, thus forming a safe harbour or anchorage. Balta presents high cliffs to the East, but its western shore is low and sandy. If a ship be leaky, there are several very commodious beaches on which she may be laid until thoroughly repaired. This harbour was, formerly, the most frequented of any in Shetland, especially by ships bound for the Greenland and White Seas.

From want of an acquaintance with Balta Sound, many vessels have been lost on the coasts of Shetland. Eight ships were stranded upon these rugged shores in the winter of 1817. Captain Ramage, (*Royal Navy*,) who has surveyed the harbour, states that a stranger, having the chart, may boldly run in, keeping the islet called *Hoony*, or *Hunie*, on the larboard, and Balta on the starboard, hand. 'Should a southerly gale raise much sea between the islands, set lofty canvas, seaman-like; keep the jib up, and steer directly between the islands: here a pilot will, it is most likely, come on board; if not, shorten sail, and, according to the wind, run to the first place of anchorage marked on the Chart, keeping the eastern part of Fetlar open of the south point of Balta.'—(*Mem. Northern Ocean*, &c. p. 71.)

In making the harbour of *Balta*, or the *Sound* of *Wya*, on the south side of Unst, the tide must be particularly attended to; more especially if a vessel attempts to take Balta by the northern passage. In shifting from Wya to Balta, it is necessary to make use of the latter part of the flood and the first of the ebb; since, without the first of these, it is difficult to beat out of the harbour of Wya: and without the last, equally inconvenient to beat into that of Balta.

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[*] *Field* or *Feld*, in Norway, signifies a hill. Hence Fell, in Scotland, &c. . *Baa* is the local term for a rock on which the swell breaks. Skar or Scar is derived from *Skær*, a rock.

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If a vessel, again, is desirous of going from Balta Sound to *Cloup Voe*, or the western parts of Yell, or from Wya harbour to the same places, it is requisite to know that the passage round the Skaw in the former case, or that of Blumel Sound in the latter, are inexpedient, or even, in certain circumstances, dangerous; and that it is far preferable to take the southern passage through Yell Sound. The strength of the current through *Colgrave Sound*, within Fetlar, though far less than that of the stream which runs with such velocity through Blumel Sound, renders it also necessary to be well acquainted with the times of ebb and flow through that passage; no less in merely sailing through it than in attempting to make the harbour of Basta Voe.

In passing round the Skaw, off the north coast of Unst, or Papel-ness in Yell, or Fedaland Point in North Maven, it is equally necessary to be accurately acquainted with the times of change; as the strength of the current is considerable in all these situations, and it is requisite to take advantage of the ebb and flood both, for doubling these headlands. The whole of the flood or ebb is equally required for making the passage from Fedaland, southward to Hillswick, or through Swarbuck's Min; or from Papa Stour to the southern harbours of Æthsting, or the reverse; and in all these cases, a miscalculation of the time or velocity of the current, if there is a short wind or a head sea, or both, may be productive of the most serious inconveniences. The same remarks might be extended to all the remainder of the western shore.

HARBOURS in YELL.—Basta Voe, on the eastern side of Yell, within Fetlar Isle, forms one of the finest harbours in Shetland; but, in thick weather, it is necessary to keep the lead always going. This harbour is formed principally by the island *Hascosea*, which covers it, and a vessel may run for it with a S.E. wind. Fetlar contains no harbour.

On the western side of Yell is *Whalfirth Voe;* but the difficulty of beating out against the western swell renders this an inconvenient harbour. To the southward of Whalfirth Voe, near Sandiwick, are two harbours, wherein vessels may lie securely.

NORTH-MAVEN, &c.—The extremity of North-Maven, near Fedaland Point, forms a peninsula of considerable dimensions, separated from the main land by a beach of shingle and rocks; the indentation on the east side forming a cove for boats, and containing a very important fishing station. In the neighbourhood are two lakes of fresh water.

Colifirth Voe, on the eastern side of North-Maven, forms a very convenient harbour for vessels losing the ebb-tide in the channel. Within it is a smaller bay, where there is always smooth water, and excellent soft holding-ground.

Burra Voe, or North Ra, to the northward of Colifirth Voe, is peculiarly convenient for vessels intending to make the passage round North-Maven; as, by taking the end of the ebb from it, they may ensure their passage round Fedaland Point, with a whole flood, to reach any of the harbours in St. Magnus' Bay: but there is a sunken rock in the entrance, which is not easily seen.

In the southern part of Yell Sound is Harasiter or Hagraster Voe, within which, in a space of nearly seven miles, vessels may anchor almost any where, quietly and securely, in clean and good ground. In *Urha Voe*, next to the eastward, there is a very good and convenient anchorage for vessels which are either employed in Yell Sound, or have not the advantage of wind or tide to effect their passage through it.

WESTERN SIDE of SHETLAND.—Fitfill Head, which lies 3½ miles to the N.N.W. of Scantness, the south end of Shetland, has been described in page 128.

Cliff Sound.—Eight miles to the N.E. of Fitfill Head, and between the islands of St. Ninian and Havery, lies the entrance of Cliff Sound, an inlet which extends N.E. ½ N. more than 8 miles. In this place, with House Island to the west, and Main-land to the east, there is good anchorage in from 15 to 5 fathoms, over toward the former. Small vessels may pass this way to Scalloway,* over a bar of 2 fathoms, which lies between Tondra Island and Main-land.†

The best passage to Scalloway is, however, between the islands of Burra and Oxna. The course and distance from Fitfill Head to its entrance is N.N.E. ½ E. 11 miles. Then, by bringing Scalloway castle E. by N., it will appear just open of a high round island, called Green Island. This mark will lead between Green Island and the small isle called Merry Holm, which is to be left on the starboard side. In the narrow passage, between these isles, are 4 fathoms. You may here run in, and anchor before the town in 4 and 5 fathoms of water.

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* Scalloway is the village next in consequence to Lerwick, but a very inconsiderable place. It is distinguished by an antient castle.

† The passage through Cliff Sound, either into or out of Scalloway, is always inexpedient, owing to the squally nature of this bay and narrow channel, and the nicety required in passing the bar of Trondray, on which there are only 12 feet at high water.

There is also a passage to Scalloway to the northward of the islands Oxna and Chanes, between them and Heldazoo, and southward of Longa. Having, in this passage, passed the latter, steer east, leaving on the starboard three island rocks, which lie to the northward of Green Island. When past these, run to the southward, until you open the castle, when you may run in, as above. Vessels may likewise run in to the northward of Heldazoo, between it and the Sandistura rocks, which lie nearly a mile N.N.W. off that island. Hence leave Longa to the southward, and proceed as before directed.

VALEY SOUND, which lies 18 miles to the N. by E. of Fitfill Head, is a good harbour. It has two entrances, of which the eastern is the best. In coming in here, steer for the S.E. of Valey Island, which is high and bold. The ruins of an old Picts castle, which stands high, at a mile to the eastward, distinguishes very conspicuously this part of the land. In coming in, with Valey island on the larboard, and a rock called Flass Island on the starboard, steer N.N.W. into the Sound, leaving, also, the Isle Linga on the starboard. You may then haul to the northward, and anchor in from 9 to 6 fathoms; but do not go too near the north side, as a sunken rock lies there.

The Harbour called Grueting-voe, to the eastward of Valey Sound, affords also excellent shelter, as vessels may lie there, land-locked, in from 14 to 5 fathoms. To sail in, observe the preceding directions for Valey Sound, leaving the entrance of that sound on the larboard, and the old castle on the starboard, side. The entrance is deep; 20 and 18 fathoms. When in, you may run up to the N.E. or N.E. by N., and anchor at pleasure.

No vessel can beat out of the East Sound with a swell from the S.W., and the attempt is attended with the greatest hazard, from the narrowness of the channel, and from the height of the land, which produces baffling squalls, and from there being no room to veer in the passage, nor ground to let go an anchor if she should miss stays.

ST. MAGNUS' BAY.—This extensive bay, on the western side of Main-land, presents several harbours and places of shelter. Papa Stour, or Great Papa, on the S.W. side of this bay, has a natural cave of three entrances, through which the tide ebbs and flows: it has several apartments, and is wide enough to admit a large boat, with the oars at full length on each side. This gloomy cavern widens toward the centre, which nature has ornamented with a beautiful arch. Beyond this, the boat is directed by a small gleam of light from an aperture in the top.

On the north side of this bay is, also, a curious islet, called Dureholm, perforated by a vast arch, 70 feet in height, under which boats fish, having light from an opening at the top.

Vessels caught in St. Magnus' Bay, with a westerly wind, have heretofore been directed to run for Swarbuck's Min, in the south part of the Bay. Now, if the wind be to the southward of west, a vessel, in attempting to weather Muckle Roo, may fail in this object, and become so deeply embayed as inevitably to go on shore on *Eglisha*, the *Long Head*, or *Isleburg Ness*. The direction, in this case, should be to make for *Hillswick* or *Hamer's Voe*, in the N.E., as more to leeward, and where the entrance is attended with no difficulty. If once to leeward of the Long Head, it would be too late, with such a sea as the westerly swell sets in here in a gale of wind, to attempt Hillswick, and equally impossible to weather Muckle Roo.

Hamer's Voe is a very secure harbour, but it is scarcely possible to beat out of it against a strong west wind, from the narrowness of the entrance, while that attempt is also attended with great risk.

There is no water, except for boats, in Rose Sound, between Muckle Roo and the main.

In House Voe, Papa Stour, is a good anchorage for ships of moderate burthen, which is also, a useful place for waiting the tide to the southward.

Ships may anchor almost any where to the west of Muckle Roo.

At about 2 miles to the northward of Eshaness, the N.W. point of St. Magnus' Bay, is the Ossa or Ocean Skerry, a lofty rock, which serves as a good beacon or mark for this part of the coast.

RONAS HILL, formerly called Reinsfeld, the Blue Berg of the Dutch, stands in the latitude of 60° 32′, or thereabout. This mountain Mr. Laing describes as follows:—

"In the passage of North Mevan, a peninsula belonging to this island, stands the cloud-capt mountain of Rona, the highest in Shetland. It is eight miles long, four broad, and 3944 geometrical feet above the level of the sea; serving for a land-mark to fishers and vessels coming from the Northern Ocean. From the top of this lofty eminence, the eye commands an extensive and pleasing prospect, stretching 50 miles, at least, in every direction. The great number of small islands and peninsulas scattered beneath, and often a distant view of vessels, in summer, afford a most agreeably diversified scene.

"On the summit of this mountain stands a house, called the watch-house, in which six or seven men can sit. It is constructed of four large stones, covered by two more for a roof, on the top of which is erected a pyramidal tower of small stones.

"In the same parish stands a rock, rising perpendicular, on all sides, to a great height, which, at a few miles distance, looks like a ship under full sail. Near to this are two very high inaccessible pillars, on which the large species of cormorant breed." *Voyage*, page 8.

FULO, or Foul Island, more properly Fowl Island, from the number of birds, is the westernmost of the Shetland Isles. It lies at 25 miles N.N.W. ½ W. from Fitfill Head. It is foul all round, particularly the north end. The isle is about 2½ miles long, by one and a quarter broad. It has a roadsted on the eastern side, called *Ham*, which is much-resorted to by the fishermen. The high land may be descried, in clear weather, from the northern part of the Orkneys.

The western and eastern sides of the island are very unequal in height. On the former side the elevation of the cliffs exceeds a thousand feet, and on the latter the coast is almost uniformly low, and, in some places, level with the sea.

At about 3½ miles to the S.E. from Fulo, lies the reef called the Havre de Grind Rocks, having a depth of only 4 feet over it at low water. From Fitfill Head, the reef bears N.N.W. ½ W. nearly 7 leagues.

The GREAT FISHING-BANK to the west of the Shetland Isles, is described in our 'Memoir and Directions for the Northern Ocean,' &c. pages 71 to 80.

TIDES *between* BUCHAN-NESS *and* PENTLAND FRITH, *and among the* ISLANDS *of* ORKNEY *and* SHETLAND.*

At Frasersburgh, Banff, and along shore to Cowsy Point, it is high water, on the full and change, at three-quarters past 11; spring-tides rise 15, and neaps from 9 to 10, feet:— At Fort George it flows at 12 o'clock: At Cromarty, at three-quarters past 11; springs rising 14, and neaps 9, feet: In the Frith of Tain, at 11; springs rise 12, and neaps 7, feet: In Sinclair's Bay it flows at 9; springs rise 9, and neaps about 5, feet.

From Duncansby Head the stream loses its strength to the southward. Off Clytheness its velocity is 3 knots with springs, and one and a half with neap-tides; continuing thus to the Ord Head. In the bays of Sinclair and Freswick there is no current, as they fall within its stream.

Off the entrance of Cromarty the stream runs at the rate of from 3½ and 4 knots. At Fort George the current runs very strongly. On the southern side of the Murray Frith, and thence to Peterhead, the stream without runs only half an hour longer than the time of flowing on shore.

In the Pentland Frith the tide runs with greater rapidity and diversity of motion than, perhaps, in any other part of the British seas. The obstructions which the direct course of the tide meets with, from the islands lying in the Pentland Frith, diverts its directions into eddies, races, counter-tide, and sometimes into whirlpools, amazing and terrifying to such as are inexperienced in tide-ways; but, to those acquainted, these irregularities become serviceable; sometimes, by keeping off the violence of the stream, and affording stagnant water, in which a vessel may tack or anchor till the return of a favourable tide; at other times, by carrying her against the tide, or more to windward, and thereby facilitating the passage to either side of the Frith; which will more plainly appear from the following description:—

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* The description of the tides in Pentland Frith and Orkneys, is from Mr. Murdoch Mackenzie the surveyor of those islands.

On the shore of Swona it flows till nine hours and a half on the east side, and till ten on the west side, on the days of new and full moon. In the middle of Pentland Frith, it is still or slack water, on the change days, at eleven hours and a half, but the tide does not turn till twelve. On the shore of Duncansby, on the south side of Pentland Frith, it is high water, on the days of new and full moon, at eight hours and a quarter.

The body of the flood in Pentland Frith comes from the N.W., and its motion is perceived sooner near the land, on either side by three hours, than in the middle of the Frith, and is gradually propagated from the shores, outward, as the tide makes. About a quarter of a mile from the middle of each island, in its way, it divides or splits into two branches, one of which runs toward the north, and the other toward the south, end of it; whence, along with the stream that runs directly by the extremity of the island, they proceed eastward, about a mile or more, and there join, inclosing an *eddy*, within which there is a low stream westward toward the island. There is one of these eddies, on the east side of the *Swona*, which extends about a mile and a half from it; one on the east side of Pentland Skerries, which is not bounded, as the other two, but opens wider as it recedes from these islands, until the streams lose themselves in the open sea. These eddies change their direction from the east toward the south, gradually, as the flood makes; so that the stream, which, at the beginning of the tide, runs from Swona between South Ronaldsha and Pentland Skerries, at the latter end of the flood, runs toward Duncansby Head. The like eddies are formed with ebb-tide, on the west sides of these islands, gradually varying their direction from the west toward the north; only the eddy of Pentland Skerries is very small, not extending above a quarter of a mile from the Great Skerry; but the others are as large, or larger, with ebb than with flood. There are whirlpools observed near the south end of Swona, with flood, but are never so large as to be dangerous to ships; and also near the north ends of Swona and Stroma, with ebb-tide.

Westward from the north end of Stroma, there is always a great swelling sea, and often breakers during ebb, in the calmest weather, especially with spring-tide, which is called the *Swelky of Stroma*, and ought to be avoided. The *Men of May* is a rough breaking sea, which makes westward from the south end of Stroma, with flood-tide.

From Duncansby Head, at two hours flood, over toward Stroma, is a very strong tide, called the *Bore of Duncansby*, which with an easterly wind and spring-tide, breaks very much. This is occasioned by a ledge of rocks in that direction, about 8 fathoms below the surface. This tide is often dangerous to boats, when they cross the Frith, but is not so violent as the preceding.

The greatest velocity of spring-tide in Pentland Frith is nine miles an hour; neap-tides do not run three.

ORKNEYS.—From some observations on the tides in Orkney, it appears that the water begins to rise and fall sooner near the shore, or near visible rocks, than at a distance from them.

When spring-tide is at its greatest altitude or depression, the water continues in a quiescent state near half an hour: neap-tides continue so about an hour and a half.

The motion of the water, both in ascent, descent, and progression, is accelerated from the first to the fourth hour, commonly: from the fourth to the last hour of the tide its velocity diminishes. This, however, admits of some variation, from the influence of winds.

The greatest spring-tides and least neap-tides are, commonly, on the fourth day after the syzigies and quadratures; but in this, also, the winds have a considerable influence; west and south-west winds making the greatest floods and least ebbs; north and north-east winds, on the contrary, hinder the rise and promote the falling of the water in *Orkney*, and on the north coast of Scotland. When flood-tide is raised higher than ordinary, by winds, the next following ebb is not so low as it would otherwise have been: when a high flood is raised by the moon only, the succeeding ebb is proportionably low.

Ordinary spring-tides rise about 8 feet perpendicular, ordinary neap-tides three and a half: extraordinary great spring-tides rise 14 feet, extraordinary small spring-tides only 5. Extraordinary great neap-tides rise above 6 feet, extraordinary small neap-tides not above 2. Yet the rise and fall vary so much, that it would require a long course of observations to determine with certainty what is most common in these cases.

When a stream of tide is interrupted by land or rocks, or confined within a narrow channel or long arm of the sea, growing uniformly narrower, the water will rise higher there than in neighbouring places where it is not obstructed. If the channel, or arm of the sea, has several windings, or reaches, as they are called in the Thames, the superior elevation will not be so considerable.

The foregoing particulars relate to the RISING *and* FALLING *of the* TIDE; *the following to the various* MOTIONS *of the* STREAM.

Toward the Coasts of Orkney, and Fair Isle, off Shetland, the flood comes from the north-west. A league or two off the coast, the strength of the stream is scarcely sensible, unless it be confined by land, interrupted by rocks, or run over shoals a few fathoms below the surface; in which cases its motion is always quicker than on an open uniform coast, where it meets with no interruption.

When the tide begins to rise or fall on the shore, about that same time the stream near the shore begins to turn or reverse its direction, a few irregularities excepted.

The stream of tide changes its direction sooner near the land than at a distance from it; insomuch that, in a place two or three miles from land, the turning of the stream is two hours, or more, later than on the adjacent shore. At the intermediate distances the stream turns at intermediate times. Hence one vessel may find a favourable tide near land, whilst another, at a greater distance, will have the stream against her, and *e contra*. This contrary direction of the stream is sensible in the narrowest channels.

During the continuance of flood, the stream varies its direction, gradually, from the east toward the south; and, on the contrary, the stream of ebb varies from the west toward the north; that is, if the stream, when it becomes first sensible, runs east, at the latter end of the tide it will run nearly south, if the proximity of land or shoals does not hinder or divert the stream another way. It will be found of advantage, in a rapid tide-way, to attend to this gradual variation of the stream.

The greatest velocity of spring-tide in Orkney, in the channels where it runs quickest, is about nine miles an hour. The celerity of neap-tide is about one-fourth of spring-tide. A spring-tide acquires a considerable degree of strength in less than one hour after its quiescent state begins; neap-tides are hardly sensible in two hours after still water. The stream is most rapid, commonly, between the third and fourth hour of the tide.

If a sound, or strait, between two islands, lies in the direction of the main body of the tide, the velocity of the stream in that strait will be greater (all other things alike) than in any other adjacent one, not lying in the same direction.

In similar straits or channels, lying in the same direction, and supplied from the same part of the ocean, the velocity of the streams will be in proportion to the width of the inlets directly and the outlets inversely.

If an island lies directly in the tide-way, the stream will divide or split, before it reaches the island, into two branches, one of which will run toward one end or side of the island, and the other toward the other end of it; and, in passing along, will be reflected a little by the land, so as not to touch it. The stronger the stream is, and the longer that side of the island toward which it runs, so much farther from it will the stream divide; and the quicker the oblique streams run along the sides or ends of the island, the stronger will be their reflection. Hence a vessel, in a calm, carried along by a rapid tide or current, is in no danger of touching a single island or visible rock, if the water is deep enough near them.

If a small island lies athwart a rapid tide-way, that part of the stream which runs along one end of it, will join what runs along the other, at some distance beyond the island, enclosing between them a curved space, within which there is either no sensible current, or a slow one toward the island, contrary to the other streams. This stagnant space in the middle of a rapid tide is called an *eddy*. If the island that occasions an eddy is large, or has other islands or rocks near it, so situated as to inflect the streams considerably out of their direct course, they will not then join, as in the former case, but go off in a parabolic form, widening from the island, and their strength gradually diminishing till they are lost insensibly in the open sea. Examples of both these eddies we have already described.

Some of them are a mile or two in length, and convenient to tack back and fore in till the tide is spent. In some there is clean ground, where, if there is not wind enough, or sufficient room for tacking, a vessel may stop at anchor till the return of a favorable tide. These eddies may not only be of great service to ships or boats, by sheltering them from a strong stream, but also by carrying them against it; and thereby enabling them to cross it with more advantage, according to the different places to which they are bound. The extent and direction of an eddy are always distinguishable by the eye, when the tide is strong; for the opposition of the bounding streams make the waves there higher and rougher, in blowing weather, or with spring-tide, and of a darker colour in calms, with neap-tide, than in other places. The most boisterous parts are near the two extremities of the island, and a little beyond the vortex, or top, of the eddy, where the streams that form it unite.

The collision of these opposite and oblique streams near the island, will excite a circular motion in the water; and, if the celerity of the tides is great, will occasion whirlpools in form of an inverted bell, wide and rounded at the mouth, and narrower toward the bottom. Those with spring-tide in Pentland Frith, near the Islands Stroma and Swona, may turn any vessel quite round, but are never so large as to endanger her otherwise. There are instances, however, of small boats, which, by the inadvertency of the rowers, dropt into and were swallowed up by them. The hiatus, or cavity, is largest when it is first formed, and is carried along with the stream, diminishing gradually in dimensions as it goes, until it quite disappears. Before the extinction of one, two, or sometimes three, more will appear, following each other like so many pits in the sea, moving along with the tide. The suction, or spiral motion, communicated to the water, does not seem to extend far beyond the cavity; for, happening in a boat to pass within twenty yards of one of these whirlpools, or *wells*, as they are called in Orkney, I was not sensible of any attraction toward it: but, indeed, it was toward the latter end of the tide, when its strength was considerably abated. The diameter of the mouth of the cavity, at that time, I judged to be between two and three feet. Fishermen affirm that, if they are aware of their approach toward a whirlpool, and have time to throw an oar or any other bulky body into it, they will get over safe. The reason is, when the continuity of the surface is broken, and the vertiginous motion of the sea interrupted by any body thrown into it, the water must rush suddenly in on all sides, and fill up the cavity. From the same reason, in blowing weather, or when the waves break, though there may be a gyration, there can be no cavity.

When there is a steep sunken rock near the concourse of such rapid tides, and not very deep below the surface, a most amazing phenomenon will happen; for, the stream being interrupted in its course, and falling suddenly over the rock, is forcibly reflected from the bottom upwards, carrying sand, shells, fishes, or other loose bodies, along with it; which, with boats, or whatever else is near, are driven with great violence from the centre of the eruption, all around toward the circumference; then the surface all over continues to swell and bubble, for some time, like boiling water, until a regular gyration ensues, and a whirlpool begins, which is carried along with the stream, as was said in the preceding paragraph. and lessens by degrees till it is quite extinguished. Soon after, a new eruption, followed by an ebullition and whirlpool, commences, and then another, until the celerity of the stream abates, or the tide rises or falls too much above or below the rock.

If the tide runs quicker or more obliquely by one end of an island than by the other, a languid current will continue running from one of these streams toward the other; that is, the tide along one side of that island will set longer in one direction than in the contrary.

If a strong stream of tide runs across the mouth of a bay that does not reach far into the land, within that bay there will be a slow stream setting contrary to the other. By attending to this, one vessel may keep her course or gain a port, while another is carried away by the tide.

During the last hour or last half hour of strong spring-tides, the stream in the middle of a channel or sound, and sometimes a mile or two off an open coast, appears rough, and breaks, as if it run over a shoal, or was continued within a very narrow channel, while the sea on each side may be quite smooth. This, strangers have often mistaken for shallow water, and, to avoid it, have needlessly gone out of their course, or dropt anchor in an improper place.

There are several tide-ways among the Orkney Islands, where, during ebb-tide only, the surges swell to an extraordinary height, and rage and break with great violence, even in the calmest weather; insomuch that, sometimes, no open vessel can go over them; but, during flood, the water there is as smooth as in any other part. Such places are called, in Orkney, *rosts*, which the inhabitants are very careful to avoid while ebb-tide continues, but are not in the least afraid of them with flood. A rost rages most with spring-tide and west wind. The most dangerous of these are, *Dennis Rost*, on the north side of North Ronaldsha; *Lashy Rost*, between the *Calf of Eda and Sanda; Rull* near *Wart Holm*, on the south side of *Westra;* and *Swelky,* on the west side of *Stroma,* in the Pentland Frith.

The velocity of spring-tides, among the southern islands of Orkney, is commonly about 8 miles an hour; and neaps 2 or 2½; but, amongst the northern islands, springs run, in different places, from 4 to 6 miles; and neaps in proportion.

On the full and change days, on the east side of Stronsa, the tide flows at 10 o'clock; in Stronsa Frith, at 11; on the east side of Sanda and North Ronaldsha at 9¾; in North Ronaldsha Frith at 10½. The stream of flood on this, as on other parts of Orkney, comes from the north-west, and runs east between Sanda and North Ronaldsha; south along the west side of Sanda, and between the Red Head of Eda and the Calf of Eda, and continues its progress through Stronsa Frith, until it loses itself in the open sea. That part of the flood which sets on North Ronaldsha divides, opposite to the Kirk, a quarter of a mile from the shore; one branch of it runs northward to Selch Skerry, and thence eastward to the sea; the other runs close along the south side of North Ronaldsha, over the Reef-dike rock, and thence to the north-eastward. The stream, near the north side of Sanda, runs along Ire and Riv to Tafts Ness, from Tafts Ness to the Start, and from the Start to Tres Ness, beyond which it is scarcely perceptible. On the east side of North Ronaldsha, the stream runs mostly to the northward. Along the east side of Stronsa, the flood runs south-east; along the west side, south; from Rousholm Head to Lamb Head, the stream, for the first three hours of flood, runs N.E., and from that time until it is low water, it runs south-west. When the south-westward stream of flood has gotten to the south-west part of Rousholm Head, it meets the stream of flood from Stronsa Frith, and is thereby turned S.E. toward Copinsha.

The stream in Stronsa Frith runs about 4 miles in an hour, with spring-tides; and, with neap tides, one or one and a half. On the north and east sides of Stronsa, the stream is scarcely perceivable, except near to Burrow Head and Lamb Head, where it runs 3 miles in an hour when strongest. On the south side of Stronsa, spring-tides run 2 miles an hour.

In North Ronaldsha Frith, spring-tides run 5 miles in an hour; neap-tides run a mile and a half. On the south side of Sanda, the stream is scarcely perceptible, except from the Start of Tres Ness, where it runs three miles in an hour when strongest.

Fair Isle.—The flood at Fair Isle, as at the Isles of Orkney, sets in from the north-west: it divides near to the shore on the north-west part of the island, and, running along the north and south ends of it, forms a large eddy on the east side. The stream, when strongest, runs about six miles in an hour: neap-tides do not run more than two. It flows here, on the change and full days of the moon, at 12 o'clock. Ordinary spring-tides rise four feet, extraordinary springs rise six; neap-tides seldom rise more than two feet.

At Fula or Foul Island, it flows at about half-past nine o'clock; springs commonly rise 6 or 7, and neaps 4 or 5 feet.

On the east side of Shetland, in general, it flows at half-past nine; springs rise 6 or 7 feet, and neaps only 3 or 4 feet.

In the harbour of Lerwick, however, it flows at three-quarters past nine; springs rise about 10 feet, and neaps 5 or 6 feet. The stream runs very slowly into the harbour.

SECTION X.

FRANCE and HOLLAND, *from* CALAIS *to the* TEXEL.

THE French coast, to the eastward of Calais, and all the way thence to the Island of Cadsand, is flat. The shore, in the whole extent, is, however, skirted with sand-hills, and the land within rises with so gradual an acclivity, as to present its elevated objects, as churches and other remarkable buildings, to the eye of the mariner from a very considerable distance. The coast of Holland, as its name implies,* is still lower. The whole, as is common with such coasts, is environed by numerous and extensive banks, as shown on the Charts, and hereafter described.

CALAIS *to* OSTEND.

THE WHOLE OF THE COAST between CALAIS and OSTEND is bordered with a broad sandy beach, dry at low water, and which, about Calais, extends to three-quarters of a mile from the harbour; at Gravelines and Dunkirk to a mile; at Nieuport half a mile, lessening thence to Ostend, where it may be considered as nearly terminating.

The conspicuous headland, called CAPE BLANCNEZ, or *Calais Cliff*, stands at the distance of two leagues to the west of Calais: and, at two leagues W. by S. from Blancnez, is *Cape Grisnez*, now distinguished by a lighthouse of the first order, in latitude 50° 52′ 10″, and longitude, east of Greenwich, 1° 35′ 9″, which was first lighted on the 1st of November, 1837.

The light, which is brilliant and fixed, is 49 feet above the ground, and 193 feet above the level of the sea at high water, and in clear weather may be seen at seven leagues off.

It is proper to notice, that several fatal accidents have occurred from mistaking this light for that of Dungeness, on the opposite coast.

Blancnez is so called from its *whiteness*, and may be distinguished 6 or 7 leagues off. The bottom, in the offing, is fine sand; but within pistol-shot of the shore are some rocks, which must be carefully avoided. To the southward of Grisnez there is a mill, and the country down to the coast appears dark or grayish. Along the shore are several rocks.

To the N.E. by N. about three-quarters of a mile from Cape Grisnez, lies the west-end of the *Banc la Ligne*, or *Anclim Bank;* a flat of 2¼ miles in extent eastward, and nearly in the direction of the coast. A small patch on the south edge of the bank is uncovered with low spring ebbs; and along its south and east sides are only 2 and 3 feet of water. The northern side is steep, and spring tides run along it at the rate of 4 knots. In proceeding toward the cape, you may occasionally stop for tide near this bank, in from 10 to 17 fathoms, good ground.

Nearly half way between the east end of the Ligne Bank and Blancnez, are two small patches of sand, called *Les Gardes*. They are steep-to, and uncovered at low water, at about half a mile from the beach.

Nearly north, more than a mile from Blancnez, lies the inner end of a bank of stones, called the *Quenois*, which extends thence to some distance N.W. by N.; and, lengthwise, to the E.N.E. This bank has, on its shoalest part, which is near the western extremity, two or 2½ fathoms, at low water.

CALAIS lies S.E. ¼ S. 22½ miles from Dover; S.E. ¾ S. 20½ miles from the South-Foreland; and nearly South, 23½ miles from the light-vessel off the North Sand Head of the Goodwin. The town appears, on approaching it from sea, like an island, with three steeples, and several wind-mills.

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* The name *Holland* is derived from the German *hohl*, or hollow, and signifies a low country.

The cliff, called *Calais Cliff*, commences at 4½ miles to the westward of Calais. Off the coast between, at the distance of from one to two miles, is a narrow bank called the *Riden*, the shoaler part of which is 2½ miles in length. On the central part the depth is less than two fathoms, but with 8 and 10 fathoms close to it on both sides. From this spot, Tardinghen church, bearing S.W. by W. ¼ W., appears a little open without Blancnez, and a wind-mill, 2 or 3 miles up the country, bearing S. ¾ W., will be in a line with the east side of a red-tiled house near the shore. There is also a broad shelf, a league in length, in front of Calais, and having from 4 fathoms to 9 feet over it at low water. This is called the *Banc des Tetes*.

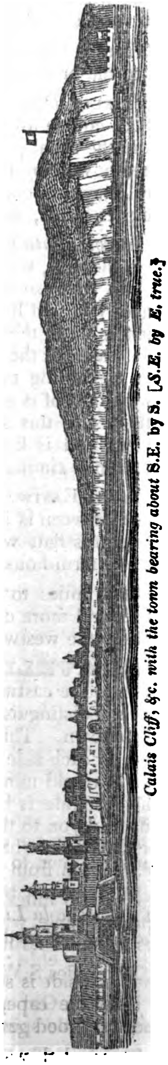
The *outer Road of Calais* is between the two banks last described, at from 2 to 3 miles N.W. by N. and N.W. from the harbour. The ground is excellent, being of coarse grey sand, with shells. The best marks for anchoring are, the great steeple of Calais S.E. by E. to S.E. and Blancnez two sails' breadth open of Calais cliff. When the great steeple is on with the westernmost fort, the bottom is of gravel, mixed with mud.

The CITY of CALAIS is an oblong quadrilateral, regularly and strongly fortified, having the harbour on its north side. The western side is secured by the citadel, irregularly constructed and situated in a marsh. In the middle of the citadel is a fine arsenal. At a mile to the westward of the latter, is the strong and handsome fortress called *Fort Nieulet* or *Nieulay*. Five other forts defend the entrance of the harbour and the road, and serve to prevent descents on the side of the strand.

The entrance to the harbour is within a long jetty or jetties, constructed of wood, and nearly three-quarters of a mile in length. Near its outer extremity, on the western side, is a little fort, called *Fort Rouge*, and off its inner part, on the same side, is a larger, named *Fort Risban*. At a mile westward from the citadel is *Fort Lapin;* and at nearly the same distance eastward from the jetty-head is *Fort Verte*, built upon piles, on the beach or strand, for the defence of the town on the N.E.

Calais is divided into three parts, viz. the *City*, properly so called; the *Courgain;* and the *Lower Town* or *Suburbs*. The Courgain is comprehended in one large bastion next the harbour, in the N.E. corner of the city, and it is the dirty place where sailors and fishermen have their residence. The Lower Town, or Suburbs, lies on the south side of the town, without the fortifications. The principal objects on approaching are the steeple of the church of *Notre Dame*, the light-tower, and that of the town-house, as shown in the appearance annexed.

There are no springs or fountains at Calais; the inhabitants, therefore, have no fresh water in their houses but what falls from the clouds, which they receive into cisterns, and several deep and very large cisterns are supported at the public expense.



Calais Cliff, &c. with the town bearing about S.E. by S. [S.E. by E. true.]

LIGHTS.—The LIGHT above-mentioned, has been exhibited on the central tower from the 1st of December, 1818. It is *brilliant and revolving*, making its circuit in three minutes; first, light increasing, then full for about thirty seconds; next light decreasing, then dark for about one minute; and thus, in constant succession, from sun-set to sun-rise. It may be seen at eight leagues off, when the weather is clear.

There is also a *tide-light (fixed)* upon *Fort Rouge*, on the western side of the entrance, which is elevated 32½ feet during the time there is a depth of 10 feet on the bar. In the day, a flag is hoisted during the same period of tide; and, in foggy weather, a bell is tolled, when these objects cannot be seen from the offing.

The harbour itself, within the jetties, lies W. ½ N. and E. ½ S., as the town does; and at its eastern part is a basin, called the *Paradise*, inclosed with kays and a wooden jetty, which will contain about thirty vessels of 150 tons; the rest of the harbour may contain 100 vessels of different sizes, to sloops of war.

There is a bridge at less than a cable's length above the basin. Within the harbour, and up to the bridge, there is more water than on the bar.

VESSELS *from sea*, to the N.W. when bound in for Calais, may steer in safely upon a S.S.E. course toward the pier-heads. Those from the north-eastward must be careful to avoid the shoal part of the *Calais Bank*, by not steering to the southward of S.W. by S., when advancing toward that shoal, and having the high steeple of Calais in that direction, until they arrive at two miles from shore, whence they may haul round to the westward for the pier-heads, and proceed as above.

In going into the harbour, which is rather dangerous with northerly winds, you must keep the mill, which stands at the east end of the town, nearly on with the jetty-head, and so run in close by the jetty. When within, keep to the eastward for Paradise Basin, where you will lie dry at low water. As the tides run strongly here, and as several ships' anchors lie in the way, it is hazardous to enter the harbour until it be almost high water. The water, at the jetty-heads, rises about 21 feet, and, within the entrance, from 15 to 18 feet, according to the winds. So soon as there are 8 or 9 feet of water in the harbour, notice thereof is given by a flag in the day-time, and by a light in the night, placed on the jetty-head: this signal is gradually hoisted, according to the progressive rising of the water; and is kept up until the water has fallen to 9 or 8 feet on the ebb-tide. This regulation is similar to that which is observed at Dover.*

COAST EASTWARD OF CALAIS.—At 5 miles to the eastward of Calais is *Waldan*; the coast between is low, with small sand-hills, which appear in hummocks. The church of Waldan is flat, with a small spire steeple; on each side of it stands a wind-mill, with several farm-houses, at a short distance from each other.

At 2 miles to the eastward of Waldan is *Oye Church*, with a spire steeple, which is larger and more conspicuous than that of Waldan, and may be known by a wind-mill, a little to the westward of it. The land continues low, with small sand-hills.

GRAVELINES.—At the distance of 10 miles E. by S. from Calais, and nearly 3 miles to the eastward of Oye, is Gravelines: the church has a tall spire-steeple, and the place is distinguishable by two wind-mills, one on the east, and the other on the west, side of the town. This town, when viewed at a distance from sea, appears like an island; the land on each side is low and full of hummocks. A little to the eastward of the town there stands an old monastery. As the harbour falls dry at low water, it cannot be entered but when the tide is high; there are two beacons, which, being brought on with each other, will lead you to the jetties. The marks for anchoring off Gravelines, to the westward of the Banks, in what is called Gravelines-pit, are Gravelines Steeple South, and Calais-cliff W. ½ S., in from 9 to 11 fathoms at low water.

Nearly 5 miles to the eastward of Gravelines, is Old Mardyck, known by its low, flat, square steeple, with several other steeples near to it. New Mardyck, or Mardyck Harbour, lies 2½ miles farther to the eastward, and has a spire steeple.

Two miles S.W. of Mardyck is the spire of *Loon*, with a wind-mill on each side of it.

Between Old and New Mardyck may be seen the broad flat steeple of Great Synthe, and the little spire of Little Synthe.

DUNKIRK [*Dunkerque*] lies 2½ miles to the eastward of Mardyck Harbour, 10 miles E. ½ S. from Gravelines, and 20 miles E. by S. from Calais. Dunkirk may easily be known by its square steeple, which is the largest and the highest of the kind on this coast, and may be seen, in clear weather, 5 or 6 leagues off. When approaching this place, you will, at 4 leagues distance, raise the *Stadthouse*, a large square building, with a small spire, near the church-steeple.

Dunkirk now exhibits by night a *brilliant fixed light*, on the tower of the *Heuguenard* at 82 feet in height above the sea, and which in clear weather may be seen at 5 league off. A harbour light, on the head of the western jetty, is 32 feet high, and may be seen a a league and a half.

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* See our Book of Directions for the English Channel, 1838.

Between Calais and Dunkirk there is a high land up in the country, called *Mount Cassel:* in clear weather this land may be seen from sea, and serves to distinguish this part of the coast from all others in the vicinity; but the fortresses about the town, and the steeples of Bergues, about four miles within, on the south, will certainly prevent mistake. At three miles eastward of Dunkirk is the church of *Lafrenouck,* with a spire: beyond this is that of *Zuytcoote,* with a square steeple. Six miles and a half eastward of Zuytcoote is *Furnes,* with two spires of different heights, and near this is *Wulpen,* with one only.

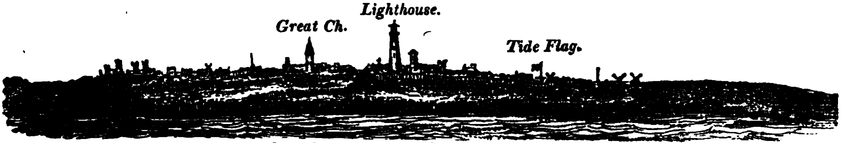
About 11 miles east from Dunkirk is the *Broers Duyn,* [*Brothers' Down,*] a long white sand-hill, which may be known by its appearing higher than any of the adjacent sand-hills, and by Furnes steeples, standing up in the country, and bearing nearly South. The BOUNDARY of the kingdoms of FRANCE and BELGIUM is 7 miles east of Dunkirk.

NIEUPORT or NEWPORT.—This place lies 4 miles eastward of the Broers Duyn, and 15 miles to the east of Dunkirk; it has a small lighthouse, with a castle, and several steeples and mills, which appear, from sea, like a fleet of ships; but the great church-steeple, which is square, with a turret on its top, appears large, and more conspicuous than the rest.

A tide-light, for the use of the coasters, was established here in 1825, and is kept lighted only when such vessels may pass the Bar. The light may be seen at 5 miles off, on approaching from the west in the direction of S.S.E., and to those from the eastward in the direction of S.S.W. On entering the port, the light must be brought to bear S. 18° E. The harbour is now fit for small vessels only, which have to lie dry on hard sand; the channel in, which has a beacon at its entrance, is a mile and three-quarters long, very narrow, unsheltered on the western side, and with strong winds cannot be attempted without risk of danger.

N.E. about one mile from the town of Nieuport, is *Lombardzyde,* appearing with a high flat steeple; within a mile farther is *Westhende,* which has a spire-steeple; and 2½ miles to the north-eastward of Westhende, is *Middelkirk,* with a high flat steeple. Nearly a mile and a half E. by N. from Middelkirk, is *Raversyde,* with a square flat steeple; at a mile and a quarter from the last, is *Mariakirk,* with a small spire; and, at 2 miles E. by N. from this is Ostend.

OSTEND lies 9 miles E. by N. from Nieuport, and appears, when at a distance, like an island; it has a church with a large spire-steeple, a town-house with a large square tower on it; a conspicuous lighthouse, and three windmills. Two of the mills may be seen very plainly, one at each end of the town; but the third seems to stand in the middle of the town, and therefore cannot be so easily discerned. The lighthouse stands in the N.E. corner of the town, near the end of the western jetty; its lantern has three reflectors, at about 80 feet above the sea; it is regularly lighted, and may be seen 3 leagues off.


Lighthouse.
Great Ch.
Tide Flag.

Ostend, as it appears from the Pier-head.

On the 18th of May, 1816, notice was given that a light had been for some time preparing in the Downs, to the east of this port, in a south-eastern direction from that already existing on the point of the jetty, and to be in use from the first of June. These lights in a line were intended to point out the best channel of the harbour; but a series of gales subsequently changed the channel, and the light on the Downs has been discontinued. Two lights since stand on the eastern jetty, as a guide to the harbour.

In February, 1818, it was stated that recent gales had again increased the bank at the entrance; and that every commander is required to take a pilot, or pay for the default.

It must be observed, that the tide still sets to the eastward two hours after high-water in the harbour.

THE

THE FLEMISH BANKS.

The BANKS, commonly called the FLEMISH BANKS, extend, in some places, to the distance of 14 miles from shore, more especially to the northward of Dunkirk. Of these banks, the westernmost, at a distance from shore, is that called the *Calais Bank*. This bank is about half a mile in breadth, and in length, from 8 fathoms on one end to 8 fathoms on the other, E. by N. and W. by S. 7½ miles. Its shoaler part is, however, only 2 miles in length, and has, over its central part, but 16½ feet at low ebbs. This part lies with the great steeple of Calais S.W. ½ S. 9½ miles, and Oye steeple S. ½ E. 9 miles. The ground is coarse gravel, intermixed with stones. The sea breaks heavily on it before low water. On each side are from 7 to 8 and 7 fathoms. Immediately without the bank to the northward, Blancnez appears just open to the westward of Calais Cliff. On the S.W. extremity of the sand, in 9 fathoms, Calais steeple bears S. ¼ W. 6¼ miles. From the N.E. end, in the same depth, Oye steeple bears S. ¾ W. 9½ miles; and Gravelines S. ¾ E. 10 miles.

POLLAERT or POLDER BANK.—Nearly in a line with Calais Bank, at 5½ miles to the E.N.E. ½ E., is the S.W. end of the *Pollaert* or *Polder Bank*, which thence extends 5¾ miles E.N.E. The southern part of this bank is the shoalest; it has only 10½ feet over it to the distance of more than a mile, and there are probably spots with less water. The extremity of this part lies 20 miles S.E. from the Goodwin floating light, with Calais bearing S.W. by W. 17 miles; Gravelines S. by W. ¾ W., 12½ miles; and Dunkirk S.S.E., 14½ miles. Near the N.E. end the depth on the bank is 4½ fathoms; and on the middle are from 6 to 7 fathoms.

The only objects that can be seen, in clear weather, from the N.E. part of the bank, are the high steeples of Bergues and Dunkirk, which bearing S. ¾ E. lead over it, in about 5 fathoms of water.

The OUTER RUTINGEN or RUTING BANK.—This bank lies to the eastward of the southern part of the Pollaert, at the distance of two miles, and it extends south-westward to the parallel of the Calais Bank, from which it is likewise distant about two miles. It is 10 miles long, and trends in a curve, with its back to the East, about E.N.E. ½ E. and W.S.W. ½ W. On the greater part of the bank, from the N.E. end, the depths are from 3 to 4 fathoms; but toward the northern end are several small and dangerous patches, of which one, having only 9 feet over it, lies at 3¼ miles S.E. by E. from the S.W. end of the Pollaert, and from which Gravelines bears S.S.W. ¾ W. 14 miles, and Dunkirk S. by E. ¼ E. 12 miles. From the N.E. end Dunkirk steeple bears S. ¾ E. 13 miles, and Gravelines S.W. by S. 14 miles.

Between the Pollaert and Outer Rutingen are from 16 to 18 fathoms of water, over a bottom of sand, shells, and coarse gravel: 5, 6, and 7, fathoms are found near the north edge of the latter, and likewise at some distance to the westward; but near the S.W. end of the Pollaert are 19 and 20 fathoms.

The ORTEIL or TOE BANK, lies nearly parallel to the southern part of the Outer Rutingen, at the distance of 2 miles. It is very narrow, and has over it from 3 to 4½ fathoms.* The S.W. end lies with Gravelines steeple S. by E. ¼ E. 6¾ miles, and there is a swash of 5 fathoms lying with the same steeple bearing South, which leads directly into Gravelines Pits and Road. Between the Outer Rutingen and the Orteil are from 14 to 17 fathoms of water, over a bottom of sand, small shells, and gravel.

The INNER RUTINGEN or RUTING is a bank, over which the sea is rough, lying 3 miles to the eastward of the north part of the Outer Rutingen. It extends N.E. by E. 5 miles, and its south end lies with Gravelines S.W. ¼ W. 12 miles, and Dunkirk S. ¼ E. 9 miles. On its shoalest part, near the middle, are only 12 feet at low ebbs. This spot is a mile and a quarter from the south end, with Dunkirk steeple nearly south, 10 miles; and at a mile and a quarter to the west of it is a detached spot of 2¼ fathoms, but about which are 4½ and 5 fathoms.

The CLIFF BANK.—To the eastward and north-eastward of the Inner Rutingen is a much more extensive and dangerous bank, called the *Cliff Bank*. It is 13 miles in length, and in some parts one in breadth, curvilinear, but its general direction is nearly N.E. by E. There are several shoal spots upon the bank, of only 2 fathoms: but the southern part is the most dangerous, there being a ridge upon it of only 6 and 8 feet. From this extremity, in 3 fathoms, Gravelines bears S.W. by W. 12 miles, and Dunkirk S. ¾ W. 8 miles. Near it, on each side, are 8, 10, and 12 fathoms.*

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* This bank is really a continuation of the *Dyck Bank*, described hereafter; although, in several modern charts, Calais Bank is erroneously and very improperly called *Continuation du Dyck*.

The DYCK BANK is separated from the S.W. end of the Cliff Bank by a swash of 6 and 8 fathoms, and nearly a mile in breadth. It thence extends, (at 3 miles within the Outer Rutingen,) 6 miles W. ½ S. The middle part is the shoalest, and there is a long ridge of 6 to 10 feet of water. We have already noticed, that the Orteil or Toe Bank may be considered as a continuation of the Dyck; as, on the narrow ridge between, the depths are 4½ fathoms, deepening immediately within to 9, and thence, to 13 and 15, fathoms.

INNER RATEEL or Geere Bank.—At the back of the Dyck Bank, and separated from it by a channel half a mile in breadth, is the *Inner Rateel Bank*, which is longer and broader than the Dyck, but with similar depths of water. Its northern end is directly opposite to the swash between the Cliff and Dyck Banks, at the distance of 3 miles. From the west end Dunkirk steeple bears E. by S. 7½ miles, and Gravelines nearly S.W. 8 miles.

The OUTER RATEEL BANK lies to the north-eastward of the Inner Rateel, at the distance of 3½ miles. The depths between are from 6 to 9 fathoms. The channel between the Cliff and Outer Rateel Banks is 2½ miles wide, and its general depths are 10 to 12 fathoms: Gravelines bearing W.S.W. leads directly through it. On the middle and southern parts of the Outer Rateel are shallow ridges of 8 and 9 feet water. The south end lies with Dunkirk S.W. ½ S. 10 miles, and Nieuport S.E. 11½ miles. From this end the sand trends E.N.E. 10 miles. From the North end Ostend bears S.E. ¾ E. 12¼ miles. On this end are several knolls of 3 and 4 fathoms.

BREEDT or Broad Bank.—Within the Dyck and Inner Rateel, the Breedt Bank occupies an extent of no less than 14 miles. The channel between it and the Inner Rateel is, in one part, but a quarter of a mile in breadth, with 5 fathoms of water. The shoalest part of the Breedt Bank is in the middle, and has spots of only 3 feet at low water. Toward the N.E. end is a long ridge of only 9 feet, and toward the S.W. another, of 3 to 9 feet. On the S.W. extremity are 3 and 4 fathoms. Gravelines bearing S.S.W. ½ W. leads clear to the westward of this bank as well as of the Dyck, which lies without it, and into Gravelines Pit.

The SMALL BANK, which lies within or to the eastward of the Breedt Bank, is improperly named; it being, as well as the latter, 14 miles in length, trending E. by N. and W. by S., and its variable depths are likewise similar. From its S.W. end the great tower of Dunkirk bears South, 3½ miles. From the N.E. end, in 4 fathoms, Nieuport bears S. by E. 7¼ miles, and Ostend E.S.E. 10½ miles.

The EASTERN BREEDT BANK lies to the north-eastward of the Small Bank, and nearly parallel to the northern part of the Outer Rateel. It extends 4 miles N.E. by E. and S.W. by S. The central and southern parts are the shoalest, and have 15 and 14 feet at low water. From the N.E. end Nieuport bears S. ½ W. 10 miles, and Ostend S.E. at the same distance. The S.W. end lies with Furnes steeples S. ¾ W., a little open to the eastward of Broers Duyn, 10½ miles distant.

MIDDELKIRK BANK.—This bank lies 2 miles to the eastward of the Eastern Breedt Bank, and extends in several detached patches, 3½ miles N.E. and S.W. Its general depths are 3½ and 4 fathoms. The north end lies with Nieuport S.S.W. 11 miles, and Ostend S.S.E. ½ E. 8 miles.

NIEUPORT or Outer Stroom Bank.—At the distance of nearly 3 miles from, and nearly parallel to, the shore, this bank extends 9½ miles E. by N. and W. by S. The west end, which is nearly in contact with the eastern side of the Small Bank, lies with Nieuport S.E. 6½ miles. The east end lies with Ostend S.E. ½ E., 4½ miles. Near the middle of the bank, and in several places more to the north, are spots of only 6 feet at low water. In other places are from 2 to 4 fathoms. Within the southern part of the sand is the ROAD of NIEUPORT, with good ground, and 9 to 7, 6, and 5, fathoms.

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* The HINDER BANK.—To the northward of the Cliff Bank, in the parallels of the Western Scheld and Walcheren Island, or rather between latitude 51° 23′ 30″ and 51° 34′, long. 2° 28″ to 2° 36½′, lies the long and narrow ridge called the *Hinder Bank*, which is the outermost of the Flemish Banks. Its S.W. end lies 4½ miles north from the N.E. end of the Cliff Bank, and the shoal extends thence N.E. ½ E. 12 miles. The depths are variable, from 5 to 4, 3½, and 2¼ fathoms: the last depth is found over a considerable part of the middle of the bank. Both sides are steep-to, from 15, 10, and 9, fathoms.

The STROOM BANK lies within Nieuport Bank, above described, and nearly parallel with the shore, at the distance of from one to two miles. Within its inner edge, toward the south, is the SMALL ROAD of OSTEND, and the GREAT ROAD is without its outer edge, on the north. From the west end the Town of Nieuport bears S. ½ W., 4 miles; and from the east end Ostend lighthouse bears S.W. one mile and a half. Upon the greater part of this bank, near the inner edge, the depths are only 9 to 6 feet, and near the east end only 3 feet, at low water.

The dangerous part of this bank begins when Nieuport bears S. by W. and it continues to shoalen eastward, but is broken by several swashes. Its southern edge is very steep, but the soundings toward the coast are so regular as to guide any vessel working within it into the small or Inner Road of Ostend.

OSTEND BANK.—This sand, formerly described under the name of the *Witter Sand*, is an irregular shoal, the outer part of which lies to the eastward of the Middelkirk Bank, at the distance of a mile and a half, and the flats extend thence to the entrance of Sluys, a distance of not less than 8 leagues. The general depths vary from 3 to 4, 2½, and 2, fathoms; but there are spots with less water. From the west end, with 3½ fathoms, Nieuport town bears S.S.W. ½ W. 8½ miles, and Ostend lighthouse S.E. 6 miles. From this end you enter Ostend Great Road by proceeding with the lighthouse S.E. ½ E. 3½ miles, and may thence take a station in 6, 5, or 4, fathoms, as may be most convenient.

On this, as well as on the Middelkirk Bank, the sea breaks heavily, particularly during northerly gales, which frequently cause a change in the position of the shoals and depth of the swashes.

The WENDUNE BANK is a small bank of 9 to 11 feet of water, lying at the distance of 3 to 4½ miles from the church of Wendune, hereafter noticed, and nearly 5 miles N.E. from Ostend. It is narrow, and on each side are from 2 to 2½ fathoms, on the flat last described.

The DUNKIRK and IN-SHORE BANKS.—The shelf of sand extending along shore, between Gravelines and Dunkirk, extends outward to the distance of more than a mile and a half, and forms the south side of the western channel to Dunkirk Roads, &c. In a parallel direction with the other edge of this bank is the inner edge of the Banks called the *Splinter, Snew*, &c. continued eastward by the *Brak Bank, Hills Bank*, and *Trapegeer;* the latter is connected with the shore near Nieuport.

The SPLINTER and SNEW lie at the distance of 2 miles from the shore of Mardyck, and form the north side of the channel to the Road of Dunkirk. The Splinter is the western part of the shoal, and has a red buoy on its outer end, which lies with Gravelines S.W. ½ W. 4½ miles, and Dunkirk S.E. ½ E. 7½ miles. The channel within is also buoyed, having three black buoys on the north, and two white ones on the south, side. The distance from the red buoy to the inner black buoy, is nearly 4½ miles. This channel is now little more than half a mile in breadth; but it has a good depth of water upward, to the pier-heads of Dunkirk, 8, 10, 11, to 7, 6, and 8, fathoms, and the deep water continues thence 6 miles more to the eastward.

The *Hills Bank* is a continuation of the Snew and Brak. Its eastern extremities are marked by two black buoys, on a swash which forms the *Zuytcoote* or *Eastern passage to Dunkirk.* This bank makes, at low water, an excellent barrier to Dunkirk Road, during N.E. winds, but its southern edge is steep, and a near approach to it is therefore dangerous. This edge lies parallel to the shore as far as its S.E. point, distinguished by one of the black buoys above-mentioned, which lies in 13 feet of water, with Dunkirk steeple bearing W.S.W. and Zuytcoote steeple South.

Hence, at a little more than a mile N.E. ¾ N. is the other black buoy, which lies in 16 feet, on the N.E. point of the bank, with Dunkirk steeple bearing S.W. by W. ½ W. and Zuytcoote steeple S. by W. ½ W.

At half a mile from the N.E. black buoy is the *white buoy*, lying in 19 feet, on the N.W. side of the Trapegeer, upon the opposite side of the Zuytcoote Passage, in which the least depth is 18 feet: but observe that from the white buoy to within a quarter of a mile of the S.E. black buoy, a long spit projects, on which there are three patches of only 12 feet of water.

On the Trapegeer Bank, at a small distance eastward from the Zuytcoote Pass, is a small knoll of 9 feet water, lying with Zuytcoote church S.W. ¾ S. The bank, thence eastward, rounds to the beach.

The northern edge of the Trapegeer Bank forms the southern boundary of *Nieuport Road,* and continues along shore at the distance of about two miles. This edge may be safely approached by the soundings until Furnes steeple comes on with *Broer's Duin.* Eastward of this line, the small bank, called the *Broer's Bank,* rises suddenly to 9 feet of water, and should not be approached nearer than in 5 fathoms. Eastward of this shoal, with Furnes steeples S.S.W. you may, by the lead, borrow upon the main shore with safety.

DIRECTIONS *for* SAILING *between* CALAIS *and* OSTEND.

CALAIS.—*Vessels from sea,* bound in for Calais, may steer in safely toward the pier-heads, and thence sail in according to the instructions given in the first part of this section. Those from the northward must be careful to avoid the shoal part of the *Calais Bank,* which lies 9 miles N.E. ½ N. from Calais, as described on page 189; Calais steeple bearing S.S.W. leads clear over the bank in 7 fathoms. Those from the eastward may proceed by the channel between the Calais Bank and Outer Rutingen Bank, with Calais bearing S.W. ½ W. Between these banks the bottom is of sand, shells, and coarse gravel; the depths 8 and 9 fathoms; but the depth increases inward to 16 and 21 fathoms, shoaling again thence gradually toward shore. From the depth of 17 fathoms, or 2½ miles from Calais, you proceed W. ½ S. for the Road, which lies as described on page 139.

Vessels from the eastward may run in between the banks called the Outer and Inner Rutingen, S.W. by W. ½ W., until Gravelines bears S.S.W. ¼ W.—With the last bearing you advance between the Orteil and Dyck Banks, and thence haul for the anchorage in Gravelines Pit to the westward; or, if bound to Dunkirk, to the south-eastward, for the West Channel, toward which you will be directed by the red buoy.

GRAVELINES.—*The mark for running into Gravelines Pits,* between the Calais Bank and Polder, is Gravelines bearing South, which will lead directly in, clear of all danger. Gravelines-steeple S. by E. will lead over the N.E. end of Calais Bank, in 7 or 8 fathoms; but a S.S.E. course would lead to the most dangerous part of that shoal.

The marks for anchoring off Gravelines, in the pit, to the westward of the Banks, are Gravelines South, and Calais-cliff W. ½ S., in from 9 to 11 fathoms of water.

DUNKIRK.—From the red buoy on the Splinter or Snew, noticed on page 144, the course to Dunkirk Road is nearly E.S.E. ¼ E. 4½ miles, to the third or last black buoy on the larboard side; and thence E.S.E. 2½ miles, to the Road off the pier-heads. The channel is now, in general, but half a mile wide, and the depths, at low water, 8 to 10, 8 and 6 fathoms, as already noticed. In advancing, be careful not to enter into the hook of the Snew on the north side, which stretches to the westward half a mile from the second black buoy, and within which, as well as without, the depth is 7 fathoms.

To sail into the Harbour, bring the innermost beacon a handspike's length to the eastward of the outer one; then steer in that direction, close to the eastern beacon, until you get into the channel between the jetties, which leads safely into the harbour.

The more particular directions which have been given for proceeding to Dunkirk, are as follow:*

Vessels from the *westward,* and bound to Dunkirk Road, having proceeded along shore, in from 18 to 14 fathoms, until *Oye* bears S. by E. may safely borrow on the shore by the lead, as far as Gravelines. Thence they proceed in 6 or 7 fathoms, to make the red buoy on the west end of the Splinter or Snew. If advancing from the *northward,* they may cross over the western part of the Calais Bank with Gravelines bearing S.E. by S., or Calais S.S.W.; or they may cross the eastern part of it, clear of its shoal, in 7 or 8 fathoms, with the tower of Oye bearing South: this track will also lead to the westward of the Orteil Bank in about 6 fathoms, whence you may proceed as above described.

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* Admiralty directions for the coast from Calais to the Hoek of Holland, 1832.

In working to the eastward from Blancnez, strict attention must be paid to the lead, and to the proper time of tide for entering inward.

Dunkirk Road, from the red buoy at the entrance, is eleven miles in extent eastward. The general depth, in the middle of the road, is 7 or 8 fathoms, bottom of mud and sand, which holds well. The northern banks are steep throughout, and the shore bank is too much so to be approached with safety.

Vessels going into the road, after making the red buoy, should so steer as to pass about one quarter of a mile to the southward of it, in 8 or 9 fathoms, and then E.S.E. between the black buoy of the Snew, No. 1, and the white buoy No. 1, on the shore bank. When in mid-channel, between these buoys, for a large ship, the course will be E. by S. about one mile and a half, when the black buoy, No. 2, and the white buoy No. 2, will come in sight, and the course will lie between them. If there be no swell, a large ship, having arrived between the first black and white buoys, may safely proceed eastward, but must otherwise wait until half-flood.

The black buoy No. 3, indicates the proximity of that part of the Snew which is uncovered at low water, and which lies about two cables' length to the westward, and it shows where the Brak Bank may be crossed by small vessels. The usual anchorage is between this buoy and the beacons on the jetties of Dunkirk; it has good holding ground of sand and oaze, which may be used if requisite to wait for the flood, and here the communication with the shore is easy. To the eastward of the jetties the bottom is more muddy, but vessels seldom anchor there, although more sheltered from northerly and N.W. winds: but, in strong northerly gales, if unable to get into the harbour, vessels should anchor between Dunkirk and Zuytcoote, because it would be less dangerous to run on shore there than to the westward; for gales to the northward and westward generally drive a heavy sea into the road. Vessels drawing 15 feet may run into the harbour at high water; but those of greater draught discharge their cargoes in the Road. The jetties project nearly N. by W. ½ W. and the entrance is dry at low spring-ebbs.

The ZUYTCOOTE PASS, or *Eastern entrance to Dunkirk Roads*, has been described. (page 144.) It lies in a N.E. ¾ N. and S.E. ½ E. direction, between the Hills and Trapegeer Banks, marked by the two black buoys on the former and the white buoy on the latter. The depth in the passage is from 3 to 4 fathoms. As the flood runs strong to the eastward, it is necessary to pass within a cable's length of the black buoys, in order to avoid the 12 feet spit before-mentioned.

Large ships should not attempt this passage without a fair wind and high water: but vessels drawing 12 or 13 feet may safely run through by bringing and keeping Lafrenouck spire as much to the eastward of the great steeple of Bergues, as that steeple will then appear to the eastward of the little steeple, and bearing about S.W. by S.; or, by keeping Zuytcoote steeple S.S.W., a little southerly.*

Observe that, if Lafrenouck steeple were brought to the *westward* of the little steeple of Bergues, there would be danger of being set on a knoll of 9 feet, eastward of the passage, bearing N.E. ¾ N. 2¾ miles from Zuytcoote, and which is less than half a mile E. by S. from the white buoy.

On quitting Dunkirk Road by the Zuytcoote Pass, you will enter Nieuport Road in about 7 fathoms; but as the Small Bank, on the north side of the road, is, in that part of it, steep-to and dangerous, and not above half a mile distant from the N.E. black buoy, you should not approach it nearer than in 6½ fathoms at low water, and change your course immediately to E.N.E. ½ E.

The NORTH CHANNEL, *between the Eastern Breedt and Middelkirk Banks*.—This channel is considered as ten miles in length, in a N.E. ½ E. and S.W. ½ W. direction: its entrance being between the north end of those banks, whence the churches, &c. cannot be clearly distinguished, it is seldom used by vessels bound inward, but answers well for vessels going out in fair weather.

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* Vessels drawing less than 11 feet, when entering the Zuytcoote Channel, and the colour of the first buoy in sight cannot be distinguished, should endeavour to pass close to the eastward of it; for should it prove to be the white buoy, there will be sufficient water for them half a mile to the eastward of it; and if the black buoy, it will direct them to the middle of the channel. A pilot may always be found.

On proceeding this way, bring Furnes on with the west part of the Broers Duin, bearing nearly South, and keep it so until the bar which connects the Nieuport and Small Banks is crossed. This bar is about a mile long and three cables' length broad, with 3 to 4 fathoms. So soon as the water deepens to 4 or 4½ fathoms, you proceed thence N.E. ½ E. for 13 miles, and will thus clear the northern parts of all the banks. The first part of this channel, between the N.E. part of the Small Bank and the S.W. part of the Nieuport Bank, is narrow, with 5 to 6 fathoms of water, but they may be approached by the lead. Between the Eastern Breedt and Middelkirk Banks the channel is much wider, and has from 6 to 10 fathoms of water.

Vessels drawing only 10 feet may go over the western part of Nieuport Bank, with the steeple of Nieuport bearing S. by E. ¼ E., but not more southerly, as that bank shoalens suddenly, and they may then stand out to the northward, without regarding the Middelkirk Bank, if the water be smooth.

To sail from the Roads of Dunkirk toward Nieuport, steer along shore by the lead, borrowing to the main, (as that side shoalens more gradually than the other,) until Bergues steeples appear within a ship's length of the west side of Lafrenouck* steeple. The steeples kept thus, will lead directly out of the *Pass of Zuytcoote*, between the Hills and Trapegeer Banks, which is marked out by the buoys above described.

NIEUPORT has been described on page 141.—Small vessels may come directly in from sea, for this place, with the town bearing S. by E. ½ E. They will thus cross over the tail of the Cliff Bank in 3 or 4 fathoms; that of the Outer Rateel Bank in 3 fathoms; the S.W. end of the Eastern Breedt Bank in 4½ or 5 fathoms; the N.E. end of the Small Bank in 3 fathoms, and the Nieuport or Outer Stroom Bank in the same depth. Within the bank last mentioned 4½ and 5 fathoms may be found in Nieuport Road.

The harbour within is dry at low water, and capable of receiving small vessels only. There are from 18 to 20 feet of water at a quarter of a mile from the jetty-head: farther in the depth toward the bar suddenly diminishes; and vessels, if compelled to run in, must pass close to the westward of the jetty, following the direction of the channel, until they arrive at the remains of an old boom, where, if no pilot be ready, they may take the sands on the western side.

The N.E. PASSAGE to NIEUPORT connects Nieuport and Ostend Great Roads, and lies between the Nieuport and Stroom Banks, in an E. by N. direction, about 5 miles, and half a mile broad. Large ships may use this passage with a leading wind, but they must wait until the tide has risen several feet, for there are shoal spots on the bar; but vessels drawing 13 feet may work through, by carefully avoiding the shoal part of the Nieuport Bank.

To sail through, bring the steeple of Nieuport on with the jetty-head, with Middlekirk S.E. by E. ¾ E. and Furnes steeples S.S.W. ½ W.; and thus there will be found from 5 to 6 fathoms of water, sand and mud, in the entrance of the channel, whence an E. by N. course, for about 5 miles, will lead into the Great Road of Ostend. On proceeding thus, there will be found from 30 to 35 feet of water in a distance of three miles, then from 18 to 25 feet when crossing the Bar which connects the Stroom and Nieuport Banks, Ostend then bearing E.S.E. ½ E., beyond which the depth increases to 5 and 6 fathoms.

In order to sail from the Great Road of Ostend to the Road of Nieuport, by this passage, bring Ostend to bear S.E. by E. ¾ E., Middelkirk South, a little easterly, and Nieuport S.W. by S.; then steer W. by S. until Nieuport steeple and beacon are in one, as above mentioned.

To proceed from the Road of Nieuport to the Small Road of Ostend, bring Nieuport steeple and beacon in one, with Middelkirk E.S.E. ½ E., and Furnes S.W. ¾ S., where there are 5 fathoms of water. A course E. ½ N., for nine miles, will take a vessel thence to near the jetties of Ostend. Caution is, however, required with regard to the Stroom Bank, which is steep-to. The shore bank, with the lead going, may be approached with safety.

Frigates and large vessels may sail, at a proper time of tide, from Nieuport Road to the

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* The first village to the eastward of Dunkirk, with a spire-steeple.

Scheld, through this channel, or through the N.E. passage, through the Great Road of Ostend.

OSTEND.—We have already noticed (page 141) that Ostend lies 9 miles E. by N. from Nieuport. From the Road off Nieuport the course and distance to Ostend, within the Stroom Bank and the bank along shore, are East 9 miles. The depths are 5, 6, 4, and 3½ to 3 fathoms.

Vessels bound in for Ostend Outer or Great Road, may enter between the Middelkirk and Ostend Banks (lying as already described) with the steeples of Furnes and Oost Dunkirk in a line, bearing S.W. ½ S. until Ostend lighthouse bears S.E. The last mark leads into the Road, where you may anchor with the great steeple of Ostend S.E. and Nieuport steeple just within a large sand-hill, nearly S.W., in 5½ or 6 fathoms, about 2½ miles from shore.

There is also good riding more to the eastward, within *Ostend Bank,* on clay ground, in 6 fathoms, with the body of Ostend S. by E., Middelkirk S.W., and Blankenburg E. by S.

To sail from the Outer to the Inner Road, small vessels cross the Stroom Bank, with the town-house of Ostend bearing S.E., but must wait until half-flood.

There is generally a pilot-vessel lying at sea, with a blue flag hoisted, in order to put pilots on board of those ships which want them; and, at tide-time, flags are hoisted on shore, at the following periods; namely, a *small blue flag* when 14 feet of water is on the Bar; a *large blue flag* when 17 feet; and a *red flag* when 24 feet.

For the state of the harbour, &c. see the description, p. 141.

Vessels for Ostend, when coming in from the northward, cross the Ostend Bank; but at night, when they have made the light of Ostend, they should stand off and on until day, or anchor in 7 or 8 fathoms, with the lighthouse to the south-westward. The soundings will indicate a too near approach to the *Wendune Bank.* The light may be seen full three leagues off, which is far enough to guard them from the Banks, or to guide small vessels desirous of anchoring in the Great Road.

Vessels drawing less than 13 feet may safely run into the Great Road by keeping the light between S. by E. and S.S.E. ½ E., and they will have about 3 fathoms of water. Smaller vessels, drawing only 9 or 10 feet, may run in with the light in any direction between S.E. by E. ½ E. and S.W. ½ S.

Should a vessel in the Great Road be caught by a gale of wind from the south-westward, she should immediately run out over the banks into the offing; but if from between West and North, she had better try for the Scheld. A large vessel, from the middle of the Great Road, in running for the Scheld, should first steer E. ½ N. or E. ¼ N., in order to pass to the southward of the Wendune Bank; and, when Wendune church bears S.S.E. ½ E., she may edge over north-easterly into the Weilling channel. Easterly winds are seldom dangerous.

The Small Road of Ostend, as already noticed, is formed on the north by the Stroom Bank; its ground is not good, particularly near the harbour; and vessels should never run for it in rough weather, unless in case of emergency. In fine weather it should generally be entered from the westward, in order to be assisted by the stream of flood in entering the port. Small vessels, to accomplish this, may cross the west end of the Stroom Bank in not less than 12 feet, by keeping Westhende steeple S. by W., but not farther westward. Vessels drawing 14 feet, must cautiously avoid a flat of 14, 15, and 16 feet, extending a full mile from shore, N.N.E. ¾ E. from Westhende steeple, and continues as far as Ostend jetty: between Westhende and Raversyde there are 22 and 20 feet near its edge; but these depths continue no farther than Mariakirk.

In the western part of the road there are 5 and 6 fathoms, a depth which continues as far as *Raversyde*; it then shallows gradually, and off Ostend there are not more than 21 feet: about a mile and a half farther eastward, where the Stroom Bank is nearly connected to the shore, are only 16 and 17 feet; but beyond that, eastward, are 20 and 22 feet, at a mile from shore.

Ostend Harbour.—As the flood runs eastward two hours after it is high water in the harbour, those intending to enter should keep to the westward until there is sufficient water on the Bar. Should it happen, in a wind blowing hard from the northward, that a pilot cannot come on board, and a vessel is compelled to run for the harbour, she should first keep the church well open to the westward of the lighthouse, on the western side of the harbour; and, on approaching the Bar, bring the two flagstaffs on the eastern jetty in a line; these lead over in the deepest water. On entering, you must pass close to the eastern jetty, and take care that the stream does not carry you to the eastward of it. You may run as far as the inner end of the jetty, and then warp to a birth as convenient.

Two lights are exhibited by night on the Eastern jetty-head at the time of high water. These, in a line, lead over the Bar. At this time of tide, the Stroom Bank can also be crossed.

Directions for Sailing to Ostend, &c. from the Westward, on the Outside of the Banks.—To the northward of the Cliff Bank, and other Banks which have been described, lies the S.W. end of the *Western Hinder Bank*. This bank lies at a great distance from shore, and directly in the track of vessels bound to the Scheld. Its S.W. end lies about 4½ miles north from the N.E. end of the Cliff Bank, in latitude 51° 23½′, and the shoal thence extends about 12 miles N.E. ½ E. to 51° 34′ N., although its breadth, in no part, exceeds two cables' length. The depths along it are very irregular, from 4½ to 2¼ fathoms, and the ridge shoalens suddenly, on both sides, from 14 to 9 fathoms.

From its S.W. end the North Foreland lighthouse bears N.W. by W. ¾ W., 38 miles; the Galloper light vessel N. by W. ½ W., 30 miles; and Ostend S.E. ½ S. 19 miles. From its N.E. end, the Galloper light-vessel bears N.W. ¾ N., 27 miles; and Ostend S. ¼ E. 23 miles. The bank may generally be discovered in the day by the tide which ripples over it: but the lead should never be neglected when approaching this or any of the Flemish Banks; more especially when in a less depth than 21 fathoms.

Ships coming from the Westward, when bound to Ostend or the Scheld, may pass on the outside of the Banks. If at 4 or 5 miles to the north of Cape Grisnez, they should steer N.E. by E. ½ E., 32 miles; allowing for the set of the tides, which will carry them 3 or 4 miles to the N.W. of the shoal part of the Calais Bank, and into latitude 51° 21½′, which is to the northward of all the banks hereabout. By keeping in this parallel, with the lead constantly going, at the distance of 13 or 14 miles, 17 fathoms will be found, about mid-channel between the N.E. end of the Cliff Bank and the S.W. end of the Western Hinder Bank, above described. As this channel is not more than 4¼ miles wide, from the depth of 4 fathoms on each side, it should be passed by day-light, when the shoal water may be seen.

By continuing to run eastward, in the parallel above mentioned, 51° 21½′, you will, after passing over some irregular soundings, of 14 to 9 and 12 fathoms, gain 6 or 7 fathoms on the meridian of Ostend, at about 7 miles from land, with Ostend bearing about S.S.W. and Blankenburg S.E. ½ E. But, as the latitude within a mile or two may not be certain, and an error may be attended with serious consequence to a large ship, it will be prudent to run into 51° 23′, or even 51° 25′ N. after passing the Cliff Bank, until they get opposite Ostend.

Ships from the Northward should not run to the southward of 51° 22′ or 51° 21′, before they have seen either Ostend, Wendune, or Blankenberg; nor should they attempt making the land to the westward of Wendune. If, before reaching the latitude assigned, the water is found to shoalen, it may possibly be on the banks off the entrance of the Scheld, and it will be proper to advance cautiously to the westward or south-westward, until a sight of Ostend town or lighthouse can be obtained.

OSTEND *to the* RIVER MAAS *or* MAES.

DESCRIPTION OF THE LAND.—Eastward from Ostend the coast continues to be composed of low sand-hills; but *Spanish Sand-hills*, which stand one mile to the eastward of Ostend, are higher than any other part of the land thereabout. Three miles to the eastward of the Spanish Sand-hills is another large sand-hill, which appears as high as the former; and, three miles to the eastward of this sand-hill, close to the sea, is the church of *Wendune*, with a square steeple.

Blankenberg lies 2 miles to the eastward of Wendune, and has a church with a peaked or bluff steeple, with two mills on the shore to the northward of it, and within it are the mill and steeple of *Uytkerke*. This place is rendered remarkable by a number of boats, which generally lie hauled up on the sandy shore. In coming in here from sea, you will see the lofty steeples of *Bruges*, standing about 7 miles up the country, S. ½ E. from Blankenberg. The coast, from Ostend to Blankenberg, trends E. ½ N. 9 miles.

The Entrance of Sluys lies about 9 miles east from Blankenberg. Between are several bluff steeples and one spire-steeple, which include those of *Lieswegen*, *Heyst*, *Ramskappel*, (spire,) *West-Cappel*, *Knoke*, and *St. Anna*. The steeple of Heyst stands near the shore, 4 miles E. ½ S. from Blankenberg; that of Knoke is two miles farther, and nearly in the same direction. At a mile eastward from Knoke, and a little farther inland, is *Hasegars Mill*, which is 2 miles to the south-westward of the Entrance or *Swin of Sluys*. The town is about 3 miles up the Swin, and may be known by a grove of trees and two bluff steeples.

The Island of Cadsand, or *Cassand*, which lies to the eastward of Sluys, is 10 miles long, and about 6 broad. Its land is low and level, and there is a church, with a spire-steeple and telegraph, apparently standing near the middle of the island. Near the west end is the little town of Cadsand.

WALCHEREN.—To the northward of Cadsand lies the island Walcheren, in the province of Zealand; it is 10 miles long, and 8 miles broad. The land, on the west part of this island, is pretty high, with large sand-hills, appearing, when viewed at a distance, in hummocks; that toward the east side is not so high, but it appears also in hummocks. The whole coast of the island is covered with white sand-hills. On the west part of the island stands *West Cappel*, having a bluff steeple, with a turret and lantern on its top: two miles and a half to the north-eastward of West Cappel is *Domburg*, with a tall spire-steeple: two miles to the eastward of Domburg is *East Cappel*, with a square steeple, and a small spire on its top. Middleburg steeple has a high spire, and may readily be seen, in all directions, when coming in from the sea.

A notice, dated Walcheren, 18th March, 1818, announced, that, from the 20th, would be lighted up the new light on the church of West Cappel. This is very conspicuous on approaching the island from the northward or the westward; as the light consists of 32 lamps, with 8 reflectors of 32 inches, which may be seen from every point, on 220 degrees of the compass.

The PORT of FLUSHING lies 7 miles to the S.S.E. of West Cappel. This place may be known by its steeple, which has a lofty spire, its barracks, stadthouse, &c. It has two safe harbours, the entrances of which are formed by jetties: they are dry at low water; but to the eastern one there is a basin, in which vessels are always kept afloat.

The principal channel to Flushing, between Cadsand and Walcheren, is that called the Deurloo. This channel is formed by the shoals hereafter described.

The North Shore of Walcheren, from the Sconce Point, at the entrance of the port of Veere, or Campveer, has three signal-stations, beside a signal-post at West Cappel. Of these, the first is on Sconce Point, and the third on a remarkable high white sand-hill by Domburg. Every part of this shore has a good beach, but commanded by the sand-hills, excepting about West Cappel, where the beach is flat, with many flake jetties, or digger works, to shelter boats.

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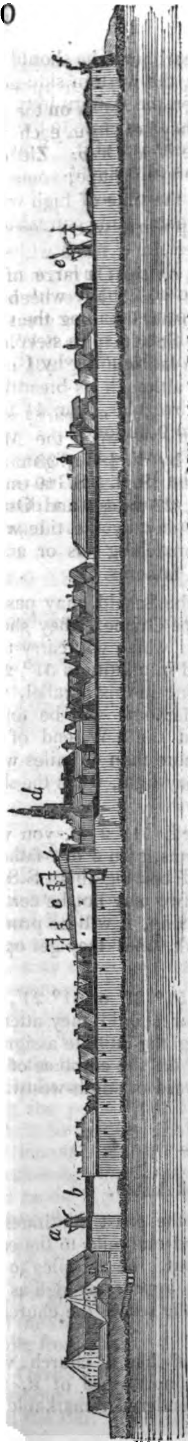

Appearance of Vissengen or Flushing, *when bearing nearly East (by comp.) two-thirds of a mile distant.*

(a) The New Mill.—(b) a White Wall.—(c) Barracks.—(d) the Great Church.—(e) Orange Mill.—(f) the Light-house.

The ISLAND OF SCHOUWEN, to the north-east of Walcheren, has many sand-hills on it; some of which are long and white, and are called the *Woolpacks;* others appear in hummocks. On the N.W. side of this island are two light towers; one stands on the easternmost part of a high sand-hill, and the other is near the shore; they bear from each other S.S.E. and N.N.W. and serve as the marks for what is called the *New Deep*. Ziederikzee church, which stands on the southern side of this island, appears, in shape, somewhat like St. Paul's, in London; and is, from its magnitude, a very distinct object.

GOEREE ISLAND lies to the northward of Schouwen, and appears, when viewed at a distance, in white hummocks; the land at the west end is highest, and has a white appearance. On this island you will see, when approaching it from the sea, a large square steeple, which shows a light by night, and a large pyramidal beacon, built with brick, which appears like a spire, and bears a light at night; and, as you proceed along the shore toward Goeree-gat, which is on the north side of the island, you will see a spire steeple, to the south-eastward of the beacon, which is that of *Outdorp*. A mill standing by Goeree church serves as a mark leading to Helvoet-sluys.

VOORN.—To the eastward of Goeree is the Island of Voorn, which appears, when viewed from the sea, in hummocks. On the eastern side of this island, upon the Maes, stands the Brielle or Briel church, with a large steeple, and exhibiting a harbour light. On the main-land of Holland, at two leagues to the northward of the Briel, is Gravesande church, which formerly had a tall spire-steeple, since destroyed, standing at a distance from shore, 4 miles N.E. ½ E. from the *Hook of Holland*, or north bank of the entrance of the Maes.

DESCRIPTION *of the* BANKS *and* CHANNELS.

The WENDUNE BANK, which has been already noticed, in preceding pages, extends parallel to the shore between Ostend and Wendune. From a spot of 9 feet, on its western end, the lighthouse of Ostend bears S.W. ½ S. 5 miles, and the steeple (square) of Wendune S.E. by E. 4½ miles. The shoal extends thence E. ½ S. a mile and three quarters, with a depth of 10 and 11 feet. From the east end Ostend steeple bears S.W. ¾ W., and Blankenberg S.E. by E. ½ E. 4¾ miles.

Eastward of the Wendune Bank the Flats of Blankenberg extend 2½ miles from shore, having at that distance from it 4 fathoms of water, and within it from 2½ to 3 and 3½ fathoms, up to the entrance of the Weiling Channel, leading to Flushing. On the eastern part of these Flats is a ridge of sand, called the *Hart*, 6½ miles long, at half a mile from shore, and which begins at a mile westward of Heyst. Its general depths are 2 fathoms, decreasing eastward and to athwart the Gat of Sluys to 3 feet only: within it is a channel of 4 to 6 fathoms, but very narrow at its eastern end, where there is a passage over a bar of 2½ fathoms into the Weiling Channel. From the east end of the Hart Sand, a branch or prong of it extends to W.N.W. 3 miles, where, with 2 fathoms of water, it ends at nearly a mile and a half from shore, with Bruges steeples appearing close to the east side of the steeple of Knoke. At a short distance outside the bank are 3, 4, and 5 fathoms of water, in the Wieling Channel. The bank is connected to the shore of Cadsand at about a mile and a half above the entrance to Sluys, and is there steep-to, with 5 fathoms close to it.

WIELING CHANNEL.—The north side of the Wieling Channel or Passage is formed by a long sand, the western part of which is called the *Rib*, and the eastern the *Hompel*. On the Rib are several shoal spots, called the *Bols*, one of which opposite to Heist is called the *Bol of Heyst*, and another, opposite Knoke, the *Bol of Knoke*. On these Bols (or Knolls) the depths are from 10 to 12 feet. In the Wieling Channel the general soundings are 5, 6, and 7 fathoms; but there is a middle ground called the *Paardemark*, and off the middle of the island Cadsand is the *Cadsand Bank*, lying at about half a mile from shore. This bank is two miles long, and on its central part are only 7 or 8 feet of water. To the northward of its western end, at the distance of half a mile, is the *Hompel*, leaving a passage between of 7, 6, and 5 fathoms.

Again, forking round from the N.W. part of the Hompel, and thence eastward toward Flushing, is the *Walvisch Staart*, or *Whale's Tail*, a bank extending E. by N. 2½ miles, and S.E. by E. ½ E., 3½ miles; thus terminating at 2½ miles W.N.W. from Flushing, where a swash separates it from the *Elboog*, a bank which will be described hereafter.

Eastward of or beyond the Walvisch Staart and Elboog, is a bank at three quarters of a mile off Flushing called the *West Kloot*, having over it from 3 to 4 fathoms of water.

The BUOYS.—The Wieling Channel is buoyed with black buoys on the North and white buoys on the South side. The outer or fairway buoy, which may be left on either side, is *black*; it lies at 4 miles from shore, with the steeples of Bruges bearing S. ¼ E., in a line with a conspicuous sand-hill about half a mile to the eastward of Blankenberg, called *Lucifer's Duin*, and the steeple of Knoke, S.E. ½ E. just open to the N.E. of another remarkable sand-hill, distinguished by the name of *Gaanpad*, and which stands at a mile eastward from Heist.

The next *black buoy* (No. 4) lies on the S.W. end of the Rib, in 4¾ fathoms, at 2½ miles E. by S. from the Outer Buoy, with the steeple of Lissweghe, S. by W. appearing between the steeples of Bruges.

The third black buoy (No. 3) lies a mile and a half E.S.E. ¼ E. from the buoy No. 4, on the south side of the Bol of Heist. The pilots call it the *Stakertjeton;* because it lies where Bruges steeples, bearing S. by W. ½ W., appear over a sandy hill called *Stakerduin:* another mark is, the pointed steeple of Ramskapelle, about S. ¼ W. in a line with the mill of Heist.

The black buoy (No. 2) is 2¾ miles E. ½ S. from No. 3, and lies in about 5 fathoms, on the south side of the Bol of Knoke, with Bruges steeples S.S.W. ¾ W. a little to the eastward of the *Gaanpad*. To the S.E. of this buoy the depth increases to 6 and 6½ fathoms, and by this increased depth you may ascertain your situation at night with regard to *Paardemark;* by day Blankenberg will be seen to the southward of Lucifer's Duin.

The *Paardemark*, or Middle Ground, already noticed, has a white buoy off each extremity. The depths on the shoal are from 2¾ to 3¾ fathoms, at a mile to the southward of the Rib Sand. The western buoy lies in 4½ fathoms about a mile S.S.E. ¼ E. from the black buoy No. 2, near the Bol of Knoke, with Lisseweghe steeple S.W. ¾ W. a little to the eastward of Heyst mill, and Blankenberg W.S.W. nearly ½ W. in one with Lucifer's Duin.

The Eastern buoy of the Paardemark is 2¼ miles E.S.E. ¼ E. from the western buoy; and lies in about 4¼ fathoms, with Bruges steeples S.W. in one with the mill of the Hazegars of St. Anna, in the outermost farm seen on the low land westward of Sluys; Cassandria, or the intrenchment, South, a little westerly, in one with the extremity of the downs to the eastward of the Sluys Gat; and Groede steeple, in Cadsand, S.E. by E. on the old Zwarte battery. The shallowest part of the Paardemark, with 16 feet of water, is rather more than one-third of a mile W.N.W. from the east buoy.

E. by S. nearly 2½ miles from the eastern buoy of the Paardemark is another white buoy, lying off the west end of the *Cadsand Bank*, in about 4 fathoms of water, with the mill of the Hazegars W.S.W. fairly visible to the northward of the Sluys Gat Downs; and the Orange Mill in Flushing *(see View)* East a little southerly, open to the southward of the harbour light-house. The bank extends about two miles E.S.E. ¾ E. from the buoy, as already noticed, and is quite steep-to on the south side. The channel between it and the shore, in the narrowest part, is one-third of a mile wide, and has a depth of 6 to 10 fathoms.

At two thirds of a mile N.N.E. ¼ E. from the Cadsand Buoy, lies a black buoy on the edge of the Hompel, in 4½ fathoms, with West Kapelle of Flanders S.W. by W. ¼ W. on with the extremity of the Sluys Gat downs, and the steeple of Ritthem E. ½ S. in a line with that of Flushing.

From the buoy on the Hompel another black buoy on the western extremity of the West Kloot Bank bears E. by S. 5¼ miles. It lies in 4 fathoms, and is to be left, when proceeding to Flushing, on the starboard side. Middelburg steeple, on with the new mill at Flushing, just clears it on the N.W., and Breskens church and mill in one, S.S.W., clears it on the West.

DIRECTIONS *for the* WIELING CHANNEL.

From the Great Road of Ostend a vessel may run along shore, at the distance of about a mile and a half, in from 4 to 3 fathoms of water, until Bruges steeples come on with Blankenberg; she must then haul off E. by N. until in the depth of 4½ and 5 fathoms, at about three miles from shore, or till Flushing steeple bears E. ¾ S., when she will be in the Wieling.

A large vessel, coming in directly from the northward, should bring Bruges steeples

S. ½ E. on with Lucifer's Down (near Blankenberg) as this will lead to the outer buoy, which may be passed on either side: the course thence will be E.S.E. ½ E., 4 miles, to abreast of the third black buoy, in 5½ or 6 fathoms: the course thence will be E. ½ S. for 4 miles, until the steeples of Bruges, bearing S.W. ¾ S. come on with the steeple of Knoke. Here will be found a depth of 6½ or 7 fathoms, off the west end of the Paardemark: having then passed between its west buoy and the black buoy No. 2 (Bol of Knoke). From this spot a course E.S.E. ½ E., for 4 miles, will carry you to the midway between the white buoy on the western end of Cadsand Bank and the black buoy on the Hompel in 6 or 6½ fathoms. The leading mark through this pass is the Orange mill *(see View)* E. ½ S. in one with Flushing lighthouse, or the steeple of Ritthem (which may be known by a large tree close to it) a little to the southward of that of Flushing, on the same bearing.

Should the buoys be removed, and a vessel be running with the marks just given, she will certainly be to the eastward of the Hompel when West Cappel [West-Kapelle] in Walcheren, bearing about N.N.E., seems approaching to the western base of the *Zaalduin* or *Saddle Hill*. This mark may be useful, even at night; for, in coming up, you will not lose West Cappel light behind the high Walcheren sand down until near the Hompel; it next disappears for a short time, behind the high summits southeastward of Walcheren down. When it disappears behind Zaalduin you will have passed the Hompel, and be to the eastward of the shallowest part of Cadsand Bank.

The leading mark hence is the Orange Mill and Flushing lighthouse E. ½ S. as given above: but when Groede steeple in Cadsand Isle bears S. by W. ½ W. it will be necessary to steer E.S.E. toward the West Kloot buoy, until Middelburg steeple appears near the west bastion of Flushing, which will lead between the Elboog and West Kloot into *Flushing Road*, where there is anchorage, to the southeastward of the town, in 9 or 10 fathoms of water.

In working up the Wieling Channel, the soundings must be the guide; these are tolerably regular, and either side may be approached to the depth of 5½ fathoms. In order to avoid the west end of the Paardemark, when standing to the southward, put about so soon as the eastern mill at Blankenberg appears on the south side of Lucifer's down; and when Groede steeple appears open to the north of the Zwarte battery, it should be kept open, in order to avoid the middle and east part of that bank.

When the steeple of Cassandria is hidden by the Sluys Gat downs, she will be to the eastward of the Paardemark, and may make a longer stretch to the southward, the breadth there being more than a mile and a half.

To the northward of the Hompel, the Walvische Staart forms a bay, which admits of longer tacks to the northward; and, when to the eastward of the Hompel, either side may be approached to 5½ fathoms, until Middelburg steeple appears close to the westernmost bastion of Flushing, which is the mark to run into Flushing Road, as before given.

BANKS and CHANNELS NORTHWARD of the WIELING.

The Outer or Western Banks, in the parallels of Walcheren are the *Western Hinder Bank*, which has been described in page 143, and other sand ridges which lie near it: for parallel to the West Hinder, and at about a mile on each side of it are two narrow banks, each of them two miles in length, on the N.W. of which are 5 fathoms over it, and on the S.E. 6 fathoms.

It appears too that, to the northward of the West Hinder is another and similar bank, which may be called the *North Hinder*. Of this the south end bears N. by W. a mile and a half from the north end of the former, leaving a passage of 18 and 20 fathoms between. It thence extends seven miles N.N.E. to latitude 51° 42′, with 7 fathoms on its extremity, though less than 4 on its shoalest part: it is very narrow, and dangerous for large ships.

Another bank, the *Fotheringham*, is represented about 4 miles farther eastward, and extending from latitude 51° 33½′ to 51° 39′. The least water on it is 3 fathoms, but between it and the North Hinder are from 18 to 22 fathoms.

The next in order to the E. by N. from the Fotheringham, is the *Chatham Bank*, in latitude 51° 41½′, longitude 2° 59½′. This is about three-quarters of a mile in length, and the least depth is 8 fathoms; from which, within less than a mile, it increases to 16 and 18 fathoms.

The *Ooster Bank*, at three leagues to the S.E. of the Chatham Bank, is another ridge, on the S.W. and shoalest part of which are 5½ fathoms. This bank, like some others hereabout, seems to be wearing away, or dispersing over the flat.

THE RABS.—In the stream of the Ooster Bank, at the distance of 5 miles, are the *Rabs*, consisting of two or three ridges of very rough uneven ground, on a bank of deeper water. The soundings on the Rabs are very irregular, from 4 to 10 fathoms, being unlike any other soundings hereabout. In some parts they have scarcely 17 feet at low tide. They are about 4 leagues from West Cappel, which steeple, on with Middelburg, bearing S.E. ½ E., leaves you on their south end, when Bruges steeples will be first open to the east of Lisseweghe, bearing about S. ¾ W. or S. by W.; but the latter is so long a mark, that it will be seen in very clear weather only. The ripples of the tide, and the lead, will, however, point out the danger with sufficient certainty.

THORNTON'S RIDGE, the shoalest part of what was formerly called the *White Bank*, lies nearly in a line with the Ooster Bank and the Rabs, but a little more to the westward. It is, like the Rabs, formed of several distinct shoals, extending 4 miles E.N.E. ½ E. and W.S.W. ½ W., and its N.E. end is 3 miles from the nearest part of the Rabs. The principal part is a continued ridge, a mile and a half long, having on its central and shoalest part 2 and 3 fathoms, and very steep-to, shoaling gradually from 19 to 6 and 2½ fathoms; very narrow, not allowing more than 2 casts in rowing across with a boat. When on the Ridge, Bruges steeples show nearly mid-way between Blankenberg and Lisseweghe, the latter place bearing S. ½ E., and West Cappel E.S.E., each about 5 leagues distant. Just to the westward of Lisseweghe is a hummock on the sand-hills. Bruges brought on with the hummock, will carry you close to the eastward of this ridge, clear of it. To the eastward of Blankenberg, is a small remarkable nab of land, which, brought on with Bruges steeples, will carry you clear to the westward of it. It is, however, to be remarked, that, as the land is low and distant, these marks will be scarcely seen from the deck of a low vessel.

The SCHONEVELD is the deep water channel, with good ground, between Thornton's Ridge and the Droog-raan on the East, and is about 6 miles over. The soundings in it are generally regular, from 12 and 10, to 15 and 16 fathoms: but more to the southward a middle ground may be found of 7 and 8 fathoms; but having on each side a greater depth.

The DROOG-RAAN or RAAN is the extensive triangular flat, of three leagues on each side, which forms on its eastern side the DEURLOO CHANNEL, and on its southern side the SPLEET CHANNEL, to Flushing. The south side of the Spleet Channel is formed by the *Rib Sand*, which has been described as the northern boundary of the Wieling Channel. The Spleet Channel is circuitous, and although wide and deep, with soft bottom as far up as the Walvische Start, it is not used by larger vessels than those which are intended to be taken across the Rib into the Wieling Channel. The entrance, abreast the west end of the Rib Sand is about a mile wide, between the depths of 4 fathoms on each side, and there are 5 fathoms in mid-channel, on soft ground.

The *Schoneveld Bank* is a shoal of two fathoms on the flat of the Raan, and to the northward of the western part of the Spleet. It is about a mile in extent E.S.E. and W.N.W., and three-quarters of a mile broad. On the N.W. side it deepens gradually from 3 to 4½ fathoms, to the anchorage called the *Schoneveld*, where the depths are from 4½ to 9 fathoms, on good holding ground.

Two miles and a half to the eastward of the Schoneveld Bank, lies the *Ridge of the Raan*, a more extensive shoal, of only 7 to 12 feet, and 3½ miles in length.

Vessels from the northward, if bound into the Wieling Channel, westward of the Schoneveld Bank, may anchor in 5 or 5½ fathoms, with West Cappel, in Walcheren, bearing East, and Bruges steeples about mid-way between Lisseweghe and Blankenberg steeples, bearing about S. ¼ W. With the last mark you may run into the Wieling. Those intending to pass between the Ridge of the Raan and Schoneveld Bank may anchor in 6 or 6½ fathoms, with Bruges and Lisseweghe steeples in one, bearing nearly S. by W., and West Cappel, in Walcheren, about E. ¾ S.

BANKS and CHANNELS *on the* N.W. *and* WEST *of* WALCHEREN.

The STEEN or STONE BANKS lie nearly parallel to the shore of Walcheren, at the distance of 6½ miles, their direction being nearly E. by N. and W. by S., from 6 fathoms at one end, to the same depth at the other, 7½ miles. The whole was formerly described as one bank, under the name of the *Inner Stone Bank*, but the late survey shows that there are five distinct patches, separated by swashes of 4½, 5, 6, and 7, fathoms. On the shoals, which are steep on both sides, are 2¼, 3, and 3½ fathoms, with some spots of less than 2 fathoms.

The N.E. end of the banks lies with West Cappel bearing S.S.W. 10 miles, and Middelburg steeple just open to the left or eastward of East Cappel steeple, bearing S. ½ E. The S.W. end lies with West Cappel S.S.E. ¼ E. about 8 miles. The principal swash is a mile and three-quarters wide, and East Cappel church S.E. ¾ S., leads through it, in the best water; or, the steeple of Middelburg a little open to the west of Domburg.

To cross the S.W. end of the bank, in coming in from sea, keep the windmill of Zouteland just on with the eastern part of the sand-hills forming the west face of the island, which now show nearly in one; or Middelburg on the middle of the long black land east of West Cappel church; or latter bearing S.E. by S. When you bring East Cappel church over the middle of the first white sand-hill far east of Domburg signal-house, you will be within the bank.

THE STEEN or STONE-DEEP, being the channel which lies between the Steen-bank, to the northward, and the flat of the Rassens, to the southward, has from 10 to 13 fathoms in the deepest part; shoaling gradually to each side. But, in standing to the southward, you may tack, at high tide, in 7 fathoms, with the guard-house, on the point of West Cappel, shut in with the sand-hills about Zouteland, bearing S. by E. ½ E.: East Cappel church on with the west end of a grove of trees behind the green-topped sand-hills, E.S.E.; and Domburg-spire S.E. by S.

The bottom of the Stone-deep is remarkably good, being sand and mud; and here the fishermen constantly trawl, and consider it as their best ground. It appears to be a perfectly safe anchorage.

The QUERENS or KUEERENS BANK is an extensive and dangerous shoal extending 5 miles from the N.W. side of Walcheren, and separating the passage called the *Oost Gat* from the *Roompot* or entrance of the Eastern Scheld. The Northern extremity lies about 5½ miles N. by E. from the church of West Cappel [West Kapelle.] The soundings over the bank are very irregular; from one to 3 fathoms, over which there is always a short breaking sea, dangerous even for small vessels.

The CALOO BANK and Flat form the west side of the entrance of the *Oost Gat*. The N.W. point of the shoal lies with the mill of West Cappel, S.E. by S. 4½ miles, and Domburg church S.E. by E. ¾ E. 6 miles. The west side, with a depth of two fathoms, trends S.S.E. a mile and three quarters from the N.W. point. From the latter a narrow prong of two fathoms projects two miles E. ½ N. At the extremity of this prong, East Cappel [Oost Kapelle] steeple, bearing S.E. by E. ¼ E. appears on the east end of an opening called the Ooster Oog or Eastern Eye; and the steeple of Groede, in Cadsand, nearly S. ¼ W. is on with the eastern part of the Wood of Wulpen.

The RASSENS are the large and irregular banks to the westward of Walcheren, between the Oost or East Gat and the Deurloo channel. Upon some parts of these banks the sea breaks at low water. They shoalen gradually to, and may be approached by the lead both on the north and west sides. The south side is more steep. The S.W. edge extends in a southerly direction, nearly 6 miles. The depths over the shoal part are from 12 to 3 feet, with the exception of a large patch which dries at low water, and lies with West Cappel Mill E. by N. 2¼ miles.

The ZOUTELAND or SOUTELAND BANK is a narrow bank, nearly 4 miles long, lying parallel with the shore of Walcheren, and forming with that shore the eastern passage to Flushing. There is but little water over it, and one patch, which is uncovered at low water, lies with Zouteland church N.E. by N. On its inner edge, nearly opposite the *Zaalduin* or Saddle-hill is a *white buoy*, and near its S.E. end is a *red* buoy, in 3½ fathoms, at one-third of a mile from shore, with Middelburg steeple, bearing E. 2° S. on the western Kaapduin.

The ELBOOG, a hard sand, nearly two miles in length, forms the S.E. angle of the Droog Raan or Raan, which has been described. Its N.W. side bounds the Deurloo Channel on the south, and is distinguished by two white buoys, which will be noticed hereafter. The S.E. extremity of the Elboog is only one mile and a quarter to the west of Flushing.

DEURLOO CHANNEL.—For vessels from the northward this is the principal channel to the Western Scheld. It is bounded by the Rassens on the N.E., and by the Raan and Elboog on the S.W. and is regularly buoyed with black buoys on the North, and white buoys on the south, side: but it has been said that, "Of all the entrances to the Scheld the Deurloo may be considered as the most difficult; partly from the great extent of the shallow banks on both sides, as well as the great distance of the land-marks; secondly on account of the flat which lies across its mouth, called the *Drempel* or Bar, through which, though there may be a narrow opening, yet large ships always wait till half flood before they pass it; and thirdly, because the early tide running southerly, and not directly into the Deurloo till two hours before high water, it might set them on the Raan." The proper anchorage to await the tide, in this case, is with Middelburg somewhere on the dyke of West Cappel.

In mid-channel, before the entrance, is a *fairway buoy;* it is *red* and lies in 4¾ fathoms, with West Cappel church S.E. by E. ¾ E. 7¼ miles. Its marks are, Bruges steeples on with the steeple of Heyst, S.S.W. 2° W.; East Cappel one degree to the southward of Domburg; and Middelburg on the Zaalduin (or Saddle Hill) S.E. by E. ¼ E. In clear weather the steeple at Flushing may hence be seen between the two mills in that town, bearing S.E. a little southerly.

Buoys.—Six white buoys are laid down on the south side of the channel, and five black ones on the north side, marked with a D (for Deurloo) and numbered from the inner ones outward. The *four black buoys,* No. 5, 4, 3, and 2, lie nearly in a S.E. ½ S. direction from the red or fairway buoy: the *first* or No. 5, at the distance of a mile and three-quarters, in 3½ fathoms, No. 4, in 3½ fathoms, nearly a mile from No. 5. From No. 4 to No. 3 the distance is a mile and a half; this lies in 3½ fathoms, with West Cappel church and mill in one, bearing E. 1° N., and Middleburg steeple close to the northward of that of Zouteland, E.S.E.

From the black buoy No. 3 to that No. 2, the distance is two miles; and thence to No. 1, S.E. ¾ E. 2 miles. The latter lies in 4 fathoms, with West Cappel on the Zaalduin bearing N.N.E. and the Orange mill in Flushing to the N.E. of the white part of the town wall, bearing S.E. From this buoy No. 1, to the *red* buoy on the south point of the Zouteland Bank, the bearing and distance are S.E. by E. ½ E. two miles.

The Outer white buoy, No. 6, lies in 3½ fathoms, at a mile and three-quarters S. by W. ¼ W. from the red or fairway buoy, and W.S.W. ¾ W. a mile and two-thirds from the *outer black buoy,* No. 5. Its marks are, Bruges steeples open to the eastward of Heyst mill, S.S.W. ¼ W., and Middelburg steeple close to the northward of that of Zouteland, E.S.E.

From No. 6 to the next white buoy No. 5, is two miles S.E. ¼ E. This lies in 4 fathoms, at 3¼ miles S. by E. ¾ E. from the fairway buoy, with West Cappel steeple and mill and the black buoy No. 3 all in a line, bearing E. 1° N. and distant from the black buoy a mile and three-quarters.

The white buoy No. 4 lies in 3 fathoms, at 2¼ miles S.E. ¼ E. from No. 5, and one mile W.S.W. ½ W. from the black buoy No. 2, with Domburg and West Cappel steeples in one, bearing S.E. by E. ½ E.

The white buoy No. 3 lies in 3½ fathoms, at a mile and a quarter S.E. ½ E. from No. 4. Its marks are, Lisseweghe steeple S.W. by W. on the Gaanpad, a high sand-hill, and Flushing steeple S.E. ¾ E.

The white buoy No. 2 is two miles S.E. ½ E. from No. 3, and lies in 3 fathoms, near the edge of the Elboog, with Middelburg steeple bearing East, on the Middle Kaapduin, and Groede steeple, South, on the Wood of Wulpen.

The white buoy No. 1, or *Elboog buoy,* lies close to the north side of the Elboog, on the part that dries, and nearly two miles S.E. by E. from No. 2. Its marks are, Middelburg steeple E. by N. on the gap called *Galgeschaar,* and Flushing steeple S.E. ¾ E., 2½ miles. The channel here is three quarters of a mile in breadth.

On the Drempel, or Bar before the Deurloo, as well as in the middle of the channel, the bottom is hard; but the margins of both the Rassen and Raan consist of soft clay. The Bar is of considerable breadth, and has no where less than 3 or 3½ fathoms over it, except on a narrow patch, a mile long, about a mile and a half S. by E. from the fairway or red buoy, and between the white buoys No. 6 and 5. Middelburg and Zouteland steeples in one, bearing East, are marks for its centre, where there are only 2½ fathoms. When West Cappel mill and church appear in one, the Drempel flat will have been passed.

From the red or fairway buoy the first course to be steered is S.S.E. until the steeples of Middelburg and Zouteland appear in a line. By taking this southerly course you will avoid some shallow spits jutting out from the west side of the Rassen, as well as the narrow patch above described.

The course will be now S.E. until Zouteland appears in the *Slob*, that is the valley in the downs before that village, and then somewhat more easterly. The Orange or southeasternmost mill in Flushing on with the white painted part of the town wall, bearing S.E. ¼ E. is an excellent leading mark for this part of the channel; but it will not be visible until so far in as to have West Cappel steeple and mill in one.

Within the Bar or flat the depth increases to 4½ and 5 fathoms, until abreast of the white buoys No. 2 and 1, where there are 6, 7, and 8 fathoms; and between the Elboog and Flushing to 10 and 20 fathoms. All that part of the Elboog which dries is steep-to.

Directions for Vessels coming from Sea and sailing up the Deurloo.

No person should make free with the Banks, unless the marks on shore can be distinctly seen. When land is visible, the island of Walcheren must be made, and the high steeple of Middelburg brought on with the S.W. end of *Klinker's Duin*, bearing S.E., which mark will lead between the Rabs and the S.W. end of the Steen Banks. Klinker's Duin is to the northeastward of the N.W. point of Walcheren.

At about four leagues from West Cappel will be found uneven ground, of 5 to 9 fathoms, on the N.E. end of the Rabs, and afterward the depth will increase to 12, 14, or 15, fathoms. Having passed this uneven ground, the course must be changed to S.E. ½ E. or S.E. by S., so as to bring Bruges steeples S.S.W. 2° W. on with Heyst, and Middelburg steeple S.E. by E. on the North side of Walcheren Duin, or East Cappel and Domburg steeples E.S.E. ½ E. This point of intersection is three quarters of a mile N.N.E. from the situation of the red or fairway buoy, and is a good place to anchor in, in order to wait for a flowing tide.

When the tide has flowed for two or three hours, steer from the outer or red buoy S. by E. ¾ E. toward the *white buoy* No. 5, or S.S.E. until West Cappel steeple and mill appear in one, bearing about East. If, in order to keep farther from the Rassen, the course should have been made a little more southerly, the vessel will probably shoalen her water about half a fathom, upon the patch between the white buoys No. 5 and 6. When Domburg steeple appears on a sand-hill named the *Koeduin*, or Middelburg steeple in a line with that of Zouteland you will have passed the Bar, and then the course must be changed to S.E., until Zouteland appears in the *Slob* or valley between the sand-hills, and then more easterly: but, if the weather be clear, the Orange Mill at Flushing, as already shown, is an excellent mark, till Middelburg has passed the Galgeschaar, when you run along shore for Flushing Road.

In working up the Deurloo Channel, you may stand to the N.E. side until the Orange mill appears to touch a little steeple situate just to the south of the great mill at Flushing. On the S.W. side of the channel, as far as the white buoy No. 2, you may stand on till the Orange mill comes against the broad steeple of the barrack; but farther in, from the second to the first white buoy, in order to avoid that part of the Elboog, another little steeple, situate to the eastward of the great one, and always seen to the northward of it, must not be brought on the south side of the new or western mill at Flushing.

From the white buoy No. 1, the Elboog turns more to the southward; and, as it is very steep, a vessel, on standing toward it, should tack when West Cappel mill begins to appear over Walcheren Duin, which lies to the southeastward of it. From the red buoy, on the S.E. point of Zouteland Bank, the coast is clear, and may be approached by the lead up to the Road of Flushing.

The **OOST or EAST GAT** of the Western Scheld. This passage, the entrance of which is between the Caloo and Queren's Banks, described in page 155, is the easiest passage to sail through, without a pilot, especially with a northerly wind. The marks may hence be distinctly seen, and the course is straight until doubling the point of West Cappel, when it changes from S. ½ W. or S. by W. to S.S.E. ½ E. between the Zouteland Bank and the shore of Walcheren.

In order to avoid the north side of the Caloo, East Cappel steeple must not be brought so far southward as the south side of the Ooster-oog, or Eastern eye, to the N.E. of Domburg: and, to clear the Querens, Middelburg steeple must not be brought to the eastward of the *Graauw*, a sand-hill to the S.W. of Domburg.

On a small flat at the entrance of the Gat, in about 3¼ fathoms of water, is a *red buoy*, which serves to point out the best channel; but it is frequently driven away in stormy weather. The marks for this buoy are, Middelburg steeple on the west part of a sand-hill called *Roggenbrood*, bearing S.E. by S.; West Cappel steeple a ship's length to the westward of the *Kaaphuisje*, a small but very distinguishable building on the N.W. point of Walcheren, bearing South; and East Cappel steeple on the first Hompel, (a sand-hill,) to the eastward of the Ooster-oog, S.E. ¾ E.

In clear weather, Groede steeple, in Cadsand, S. 5° W., just clear of the point of West Cappel, is a good leading mark for the entrance of the Oost Gat, until within a mile of the point. These marks must then be opened, in order to give the point a berth. When Domburg steeple approaches West Cappel, the water deepens to 5 or 6, and off the point of West Cappel to 9 or 10 fathoms. The shore is flat a little way off to West Cappel mill, and a little to the northward of it, and round the point opposite Walcheren Duin. The channel here becomes narrow, in some parts not exceeding one-third of a mile; but the depth increases from 10 to 12 fathoms, and both sides are steep-to.

On the north side of Zouteland Bank, is a buoy called the 70 *Roeden Buoy*, from being placed at the distance of 70 rods from the head bearing that name. The *red buoy*, on the S.E. extremity of the Zouteland Bank, has already been noticed. See page 155.

In order to sail into the Oost Gat, from the anchorage in the Steen or Stone Deep, bring Middelburg steeple S.E. by S. on with Roggenbrood sand-hill, and keep it so till West Cappel steeple, bearing South, comes within a ship's length of the Kaaphuisje, which is the place of the red buoy: steer thence, so as to pass at about a cable's length from the point of West Cappel, until West Cappel church and mill appear in a line. But, if the weather be clear, Groede steeple kept open, but close to West Cappel point, will lead over the flat a little to the westward of the red buoy, and up to West Cappel point, observing to open it in advancing, in order to be at the distance above mentioned, when the church and mill come in one. The course will now be S.S.E. ½ E. along by the coast, with the lead going, and taking the soundings from the shore.

On working in to the Oost Gat, after arriving within the flat ground at the entrance, you may stand eastward until West Cappel mill bears S.S.W., observing to keep that mill clear to the westward of every thing seen on the dyke of West Cappel; and you may stand to the westward until Groede steeple, in Cadsand, comes on the western half of the wood of Wulpen, but not farther; and that only until Middelburg opens to the southward of West Cappel mill; for beyond that it would lead you too near the N.E. part of the Rassen.

Here another mark presents itself to clear that bank, which is Flushing steeple showing itself through the Kloof or Gap of Dishoek; therefore tack so soon as it is seen; and note that it is useful only until abreast of the *seventy roeden* white buoy.

On standing toward Zouteland Bank, attention must be paid to the rippling of the current, constantly found there, and tack in time to avoid it.

None but small vessels should attempt to work through this narrow channel by night, for their only guide will be the quality of the bottom, which is very soft in mid-channel, and hard sand on approaching either the shore or Zouteland Bank, so that it will be necessary to tack instantly, on discovering the change. As the high downs may mislead in estimating the distance, it is at all times advisable to keep, as much as possible, to the shore side, being steep-to, and also because the flood-tide, with which vessels go in, always sets, more or less, over to the Zouteland Bank. From the red buoy on the South end of this bank to Flushing, you proceed as directed for the Deurloo channel, page 156.

FLUSHING ROAD lies between the town and the western point of a bank called the Kloot, and has good holding ground in 9 and 10 fathoms; but in some parts are 20 fathoms; and gales of wind from the southward send in a heavy sea, which compels ships to seek shelter higher up.

Merchantmen and small vessels may find a good road inside the Kloot to the eastward; but large ships generally run up the river, and seek shelter before *Terneuse*, 12 miles higher, on the south side of the river. These may pass in 4½ or 4¾ fathoms over the flat of the Kloot, by keeping the ruins of a church in Flushing, on which are the remains of a telegraph, but no steeple, open to the west of the Orange mill; and, when the depth increases to 5½ or 6 fathoms, they must steer E.S.E. to abreast of the north point of a shoal called the *Spykerplaat*, from whence the great steeple at Flushing, between the two mills, is a leading mark. On the north point of the Spykerplaat is a *black buoy*, the marks for which are, Flushing steeple on with the Orange mill; Middelburg steeple on with that of Ritthem, and Groede steeple in Cadsand close to the westward of Breskens church.

The CITY of ANTWERP, the chief port of BELGIUM, on the circuitous routes required by the numerous banks and windings of the river, is 45 miles above the road of Flushing. Its stately cathedral is a remarkable object in the distance from the upper part of the river, the top of its spire being 460 feet in height. At the Kay, which is 360 fathoms wide, is a depth of 5 fathoms at low water, and here the tide rises 15 feet. One of the basins is capable of containing 40 ships of the line.

The **ROOMPOT** *and EASTERN SCHELD.*—Having, in pages 154, 155, described the *Rabs* and *Stone Banks*, lying off the mouth of the Hondt, or Western Scheld, we have now to notice those in the more immediate track to the *Roompot*, or *Entrance* of the *Eastern Scheld.*

The NOORDER BREE, or NORTHERN BREE BANK, is a narrow sand, extending N.E. ¾ E. and S.W. ¾ W., about 6 miles. Its north point lies nearly in the parallel of 51° 51′, and at the distance of about 16 miles N.N.W. from the lighthouses on the N.W. end of Schouwen. The depths over it are 9 and 10 fathoms. Within this bank, and nearly parallel with it, at the distance of 4½ miles, is another, called the *Middle Bank*, having 7, 8, and 10 fathoms over it. Between these banks, the depths are 15 to 17 fathoms; and, between the Middle Bank and the *Keel*, or entrance of Brouwer's Haven, are from 14 to 12, 10, 8, 6, and 4 fathoms.

CHATHAM BANK.—Near the meridian of 3° E., in latitude 51° 41½′, is a bank, three quarters of a mile long, called the *Chatham Bank*. The least depth over it is 8 fathoms, from which, within less than a mile, it increases to 16 and 18 fathoms. From West Cappel, this bank bears N.W. ¾ N. 19 miles, and from the Rabs, (see p. 154) N. ¾ W. 7 miles.

At 8½ miles southeastward from Chatham Bank, and 2½ miles without, or to the N.W. of the Southern Steen Bank, lies the *Ooster Bank*, a narrow shoal, on the S.W. and shoalest part of which are 5½ fathoms. In the channel between it and the Steen Banks are from 10 to 17 fathoms. This bank, like some others hereabout, seems to be wearing away, or dispersing over the flat.

The *Steen Banks* and *Querens*, lying off the Roompot or entrance of the Eastern Scheld, have been described in page 155.

The BANJAARD, or BANJART, is a great flat lying off the mouth of the East Scheld, and west of the west part of the island Schouwen, thus forming the north side of the Roompot, or entrance of the East Scheld. It is divided into two parts, separated by the *Middle* or *West Gat*. Several parts dry with the tide, but there are swashways, as well as a narrow channel for small craft between the North Banyaard and Schouwen. The banks, altogether, are about seven miles broad, and extend westward from the west end of Schouwen about 8 miles, leaving a passage of a mile and a half, between them and the northern Steen Bank, the depths in which are from 5 to 14 fathoms. The channel called the Middle or West Gat leads into the Roompot, close to the southward of Schouwen.

The South Banjaard approaches to a triangular form, 5½ miles over. Its S.W. part projects toward the Roompot, and has a depth over it of 2 to 2½ fathoms. A northern prong or arm of it extends to the Middle Gat, and has 2 fathoms on its extremity; but the eastern part dries full two miles in extent, and is three quarters of a mile wide. This dry part is called the *Noordland*, and its eastern end is nearly three miles to the westward of the S.W. point of Schouwen.

On the *North Banjaard*, to the N.N.E. of the Noordland, about three quarters of a mile, is the *Zeehonden Plaat*, a dry bank, about two miles long and one mile wide, lying nearly parallel to the Noordland, about E.S.E. and W.N.W. The *Nieuwe Sand* is another dry bank on the Noord Banjaard, and forms the south side of Brouwershaven Gat. To the eastward of the Zeehonden Plaat are more dry rocky patches, called the *Krabbe Shoals*, forming on their east side the *Krabbe Gat*, a narrow channel used by fishing vessels and coasters.

The edges of the South Banjaard, which are to be avoided by shipping coming in from the northward for the Roompot, are its west and S.W. points. At the former, in 3 and 3¼ fathoms, Middelburg steeple, S. ¼ E. is half its apparent height to the eastward of East Cappel steeple, and West Cappel steeple S.S.W. ½ W. appears on with the first sand-hill to the N.W. of the flat-topped sand-hill *Zaalduin.* West Cappel steeple kept on any part of that hill will lead clear to the westward of this and every other part of the Banjaard.

The S.W. point of the South Banjaard, called the *Banjaard Rassen*, has only two fathoms over it, although there are three fathoms within it. This point lies with Middelburg and East Cappel steeples in one, bearing S. ¾ E. Middelburg S. by E. ¼ E. on with the wood seen over the downs between East Cappel and Domburg, clears it.

The southern edge of the South Banjaard is denoted by three black buoys. The outer one lies at a mile and a quarter from shore, in 4½ fathoms, with East Cappel steeple bearing nearly S. ½ W.; and the great steeple at Veere on the west side of the *Witte Duin* or *White Down*, bearing about S.E. by S.* The other buoys lie in an E. by S. direction from the outer buoy, on the south side of a shoal called the *Hompel;* the one at the distance of a mile and three quarters, and the other at three miles.

The ONRUST.—At nearly midway between the two buoys last mentioned, on the opposite side of the channel, is a *red buoy* on the western extremity of the *Onrust*, a large bank projecting 2½ miles westward from the N.W. part of *North Beveland*, and separates the *Veere Gat* from the Roompot. This buoy lies at rather more than one-third of a mile from the shore of Walcheren, and it lies with the great tower of the town of *Veere* (or Camp Veer) S. by E. ¼ E., and just appearing behind the downs at the N.E. point of the island.

Above the red buoy of the Onrust, the *Veere Gat* is distinguished by six black buoys on the east, and three white buoys with three beacons on the west, side.

The first black buoy in the Veere Gat lies on the edge of the Onrust, at a mile and one third S.E. from the red buoy: the second, nearly a mile S. ½ E. from the first; and the third, on the point of a long spit of a shoal called the *Ruiter Plaat.*

Nearly opposite the first black buoy, at the distance of one-third of a mile, is the first white one, on the N.E. point of a sand called the *Bree;* and, at five-sixths of a mile S. by E. from the first, is the second white buoy, on the N.E. point of a bank called the *Scotsman*, and nearly opposite the second black buoy: hence to the third white buoy, which lies off the south end of the Scotsman, the bearing and distance are S. by W. one mile: between the last two buoys, the edge of the Scotsman is marked by three beacons.

The Spit of the Ruiter Plaat, marked by the third black buoy above mentioned, almost unites with the Scotsman, leaving only a very narrow passage between the buoy and the beacons: through this passage, having only 10 feet at low water, all vessels must cross over from the east to the west side of the channel.

A fourth black buoy lies off a part of the Ruiter Plaat which dries at low water, and nearly abreast of a guard-house on Walcheren; a fifth, at a little beyond the entrance of Veere Harbour, and a sixth on the S.W. border of a bank called the *Orange Plaat*, opposite the Haven light at the entrance to Middelburg. In sailing upward, it follows that all these black buoys are to be left on the east or larboard side.

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* The *Wilte Duin*, or *White Down*, is a very long down, and the highest on the N.E. side of Walcheren. The northern extremity of the island is called the *Oost Hoofd* or East Head.

In order that the preceding descriptions may accord with the charts in general use, we have, in general, continued the mode of spelling the names as heretofore: for the terminative *kerque*, or *kerke*, we still give kirk, as Dun*kirk*; Cappel, for *Kapelle*, &c.

To the British seaman, who may happen to possess the new Dutch charts of the coast of Holland, &c., the following translation of words may be acceptable:—

Baak signifies a beacon; *bosch*, a wood; *boschje*, a grove; *diep*, deep or passage; *door*, by; *droog*, dry; *duin*, a down; *en*, and; *goud*, gold; *het*, the; *hoog*, high; *kaap*, a beacon; *laag*, low; *lange*, long; *meest*, most; *met*, with; *mond*, mouth; *nieuwe*, new; *of*, or; *oost*, east; *oude*, old; *rood*, red; *strekking*, direction; *stroom*, stream; *te*, at; *tonne* or *ton*, a buoy; *uiter*, outer; *uur*, hour; *van*, of; *voet*, a foot; *voeten*, feet; *volle maan*, full moon; *vuur baak*, a light beacon; *vuur toren*, a light tower; *wachthuis*, a guard-house; *weg*, way; *witte*, white; *zuid*, south; *zwart*, black.

The *depths*, taken at low water, are expressed in *palms*, each of one-tenth of the metre, or say 4 English inches: hence 9 palms equal half a fathom; 18 palms, one fathom; 36 palms, 2 fathoms, &c. (*Surveys of Captains Ryk and Keuchenius*, 1833.)

The depths, as far up as the first black and white buoys, are 5 and 6 fathoms: then follows a narrow bar of 3½; beyond this again are 6 and 7 fathoms up to the third black buoy, where there is a broad bar of 10 feet, as above mentioned. Thence the depths increase gradually to 3 fathoms; abreast of the guard-house to 5, and off Veere to 7 fathoms. Opposite the channel to Middelburg is a similar depth, but between is a flat of 2¾ fathoms.

The Channel of the Eastern Scheld, up to Zierikzee, is regularly buoyed, but the sands are too varied, and the passage too intricate, to be understood by a stranger from mere description only; we, therefore, now again advert to the sailing directions for entering the river.

Vessels from sea, for the purpose of anchoring in the Stone Deep, may pass either to the N.E. or S.W. of the Stone Banks, or through the channel between them, which has been noticed on page 155.

In order to pass to the S.W. of those banks, run in with West Cappel mill on with, or open a little to the northeastward of, the sand-hills called Walcheren Duin, bearing S.S.E. ¾ E.; the sand-hills will then appear in one line. Keep the lead going, and, at 7½ miles from land, you will pass the S.W. extremity of the Stone Banks in from 5 to 7 fathoms. So soon as the water deepens to 9, 10, and 11 fathoms, haul up to E.N.E. ½ E. until Middelburg steeple comes on with the west end of the wood between East Cappel and Domburg, bearing about S. by E. ½ E., and Middelburg steeple S. by W. Here you may anchor in about 7 fathoms.

If intending to pass through the swash or channel between the banks, so soon as the objects on Walcheren become visible, it will be requisite to bring Middelburg steeple in a line with that of Domburg, bearing about S.S.E. ½ E., and then proceed in that direction. In order to ascertain your situation when approaching, observe that, while the angle between West Cappel and Domburg steeples is less than 18° 12′, you will be to the northwestward of the swashway; when the angle has increased to 20° 15′, you will be in it, in from 4½ to 6 fathoms; and, when increased to 22° 27′, you will be within the banks, whence the course to the anchorage above mentioned will be E.N.E. ½ E.

If coming in between the N.E. extremity of the Stone Banks and the Banjaard, you must bring Middelburg steeple S. ¾ E., its apparent height open to the eastward of East Cappel steeple, and may run in that direction until West Cappel church comes on with the remarkable flat-topped sand-hill *Zaalduin,* to the southward of it, bearing S.S.W.; then haul immediately to the W.S.W. ½ W. for the anchorage.

On proceeding from the anchorage in the Stone Deep toward the Roompot, and having brought Middelburg steeple about S. by E. ½ E., on the wood seen over the hills between East Cappel and Domburg, run with that mark on until West Cappel mill appears to the eastward of the Hakkelingen sand-hill, bearing S.W. ¼ S.;* the course thence to the Veere Gat will be about E.S.E.

If working in, the flat or shoal on the south side, as far in as *Oosterhoofd,* (the northern extremity of Walcheren,) will be avoided, if a barn near the N.W. point of North Beveland be kept open of the main shore of Walcheren, bearing about E.S.E.—For the north side the only guides are the buoys and soundings. When West Cappel steeple comes on the *Graauw* sand-hill, on the west of Domburg, you will have passed the outer black buoy.

Having entered the Veere Gat, between the red buoy of the Onrust and the Bree Sand, the course toward the first black buoy will be about S.E., until nearly mid-way between it and the white buoy opposite; then more southerly, till the steeple of Armuiden comes on with the guard-house on the corner of the dyke. This mark leads close to the eastward of the white buoy on the N.E. point of the Scotsman, and also clear, but too close, to the northern black buoy of the Ruiten Plaat; it will, therefore, be prudent to keep nearer to the beacons than to the buoy, and to steer from abreast of the south white buoy directly on toward Veere, keeping very close to the shore until abreast of the town, and there anchor; or proceed onward, in the same manner, to the entrance of Middelburg, and there anchor.*

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* The *Hakkelingen* sand-hill is on the N.W. point of Walcheren, a little to the east of the *Kaaphuisje,* mentioned in page 158.

The Veere Gat is rendered narrow by the sand-banks, particularly between the spit of the Ruiten Plaat and the Scotsman, where it is very shallow at low water; yet, when a vessel has advanced so far up, she will have the advantage of being sheltered all round, and very little incommoded by a rough sea. The streams of tide also take the direction of the banks, and run directly in or out.

BROUWERS HAVEN.—To the eastward of the northern part of the North Banjaard,† is the KEEL, or Channel of Brouwers Haven; the north side of which is formed by the *Ooster Bank*, a long sand, which stretches about 10 miles westward from the island Goeree. This bank is very dangerous. The south side of the Keel is formed by the banks and shore of Schouwen. The northern part of the Ooster sweeps round to the West Gat of Goeree, and its southern side is bounded by a passage called the *Kous*. The shoalest part of the bank is toward the northern edge, some patches on which dry at half ebb, four miles from the downs of Goeree, with only from one to three feet, and some dry patches between. Westward of these, to the extent of seven miles from the island, are from 5 to 10 feet of water, and beyond these are depths from 15 to 16 feet. Along the north side of the Ooster Bank, the ground is soft, and the soundings are irregular, so that in the night it cannot, even with the lead, be approached safely.

The *Middel Plaat*, a large shallow flat, rises on the south side of the Ooster Bank, having only 6 feet over it, and part of its east end dries. To the northward of the Middel Plaat are several shallow patches of 5 or 6 feet.

The Springer, a very shallow bank, projects to a considerable distance from the S.W. side of Goeree; it partly dries at low water, and forms the N.W. side of Springer's Diep, on the south side of the island.

The *Hompel-voet* and *Paarde Plaat*, forming the south side of Springer's Diep, are extensive banks, the greatest part of which dry at low water. They separate the Springer's Diep from the road of Brouwer's Haven.

Another Bank, the *Dwars in den weg*, or *Thwart way*, lies before the harbour of Brouwers Haven, nearly E.S.E. and W.N.W. Great part of it dries at low water. At its west point, the Brouwers Haven channel divides into two parts, of which the southern one, which is very narrow, runs between the shore of Brouwers haven and the bank, while the northern separates into two branches.

The Entrance of the Gat of Brouwers Haven is about three quarters of a mile wide, from the depth of 4 fathoms on each side, as far as the west end of Schouwen: farther eastward the width is contracted by the projecting points of the banks.

BUOYS.—At the western extremity of the Ooster Bank, is a large black buoy, the Outer Buoy, in about 4 fathoms, with the steeple of Veere bearing S. 13° W.; the light-towers of Schouwen S. 23½° E.; 3⅚ miles.

Another black buoy lies in 13 feet, on the south edge of the bank, nearly a mile from the strand of Schouwen, with Brouwers haven steeple S.E. ¾ E. on with the north side of the trees of Beukelaar; Renesse steeple S.S.E.; and the light towers of Schouwen S.W. by W. ¼ W.

On the south side of the Gat, upon the edge of the North Banjaard, are two white buoys.

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* By an advertisement, dated 1st of September, 1817, the Chamber of Commerce and Manufactures at Middelburg acquaint the merchants, and all persons therein concerned, that the new channel of their port, which has its entrance toward Veere, is finished and open for navigation, and that the largest vessels can safely pass through it to the town, which is provided with secure and spacious storehouses, fit to contain all sorts of goods, where there are likewise different and very respectable commission-houses. Since the restoration of peace, the intercourse with the East and West Indies, the United States of America, and different European ports, has been carried on by the inhabitants with success; the trade in corn and madder is likewise pursued with all liberty. The town has besides obtained, by favour of the king, the privilege of allowing foreigners to deposit their goods, and export them again to other countries, free of all duty for importation or exportation; as the duties on imported foreign goods and wares are required only on such as are to be used in the Kingdom of the Netherlands.—*Newspaper, Sept.* 1817.

† The shoals called the Hide and New Sand, as commonly shown in the charts, lie on the flat of the Banjaard.

The first in 5 fathoms, at a mile S.S.E. from the outer black buoy, with Renesse steeple bearing S.E. by E. ¾ E.; Schouwen light-towers S.S.E.; and Veere steeple S. by W. ¼ W. The second white buoy lies in 3 fathoms, one mile and a half S.E. by E. ½ E. from the first, with Renesse steeple bearing S.E. by E. ¾ E.; the light-towers S. ¾ W. a mile and three-quarters; and Veere steeple S.S.W. From this buoy the edge of the bank approaches gradually to the shore of Schouwen, until about North from Renesse, the *Schaar*, a spit of sand, extends from the strand to nearly a quarter of a mile, having over it about 15 feet of water.

Nearly opposite to the western part of the Schaar is a projecting point of the Ooster Bank, with 3¾ fathoms over it; the breadth of the channel is thus contracted to little more than a cable's length, but with a depth of 5½ fathoms; but it soon widens again, and the depth thence increases to 7 and 8 fathoms till near Brouwershaven, where, especially close under the shore, are from 10 to 12, and in the Road 7 to 9, fathoms.

From the *Ossenhoek*, about a mile and a half below or westward of Brouwershaven, a rocky shoal extends 155 yards outward.

The channel between the Thwart-way shoal (Dwars in den Weg) and Brouwershaven is very narrow. At the entrance, between Ossenhoek and the west end of the bank are only 15 feet at low water, but farther up are 8 and 9 fathoms to athwart the Sluice of Brouwershaven, where there are only 5 fathoms. From this part a narrow bank lines the shore, which, from the east end of the *Lookout Dyke*, extending farther off, forms with the east end of the Thwartway Shoal the eastern side of this channel, in which there is scarcely two fathoms of water: beyond this it falls into the *Grevelingen Channel*, or main stream.

SAILING DIRECTIONS for BROUWERSHAVEN.—Those advancing from sea, and not being farther north than the parallel of Schouwen, will gain sight of the island Walcheren, which may be readily known by the steeples of Middelburg, East Cappel, and Domburg. To the S.E. the island Schouwen will be seen. So soon as the high white sand-ridge, on which stand the light-towers, comes in sight, it must be brought to bear S.S.E. or S.S.E. ½ E. and steering toward it, in that direction, will lead to the outer black buoy.*

So soon as the steeple of Renesse appears, which is the only steeple to be seen from outside the Gat, bring it on the east side of the *Ooster Doodkist*, the second sandhill to the eastward of the low ground, and keep it so long as the spire of the steeple is to be seen above the middle of a groupe of trees standing on the downs. This is the mark for entering into and sailing up the channel, and so long as it remains in sight a vessel may sail on, passing the white buoys of the North Banjaard on the starboard hand. When the light-towers bear S. by W. you will be abreast of the second white buoy, lying off the Hoek of Schouwen; and, if the weather be fine, you may proceed onward until Veere steeple, in Walcheren, disappears behind the downs of Schouwen, or that the light-towers bear S.S.W.

Quitting the last mark, you must now steer E. by S., and passing the black buoy of the Hompel and the shore, you will be able to thread the narrow opening off the Schaar by the lead and by the steeple of Brouwershaven, which will be seen to the northward or clear of the trees of Beukelaar† when the steeple of Renesse bears S. by W. Next steer S.E. by E., nearing the shore until the steeple of Zierikzee comes to about a ship's length westward of Brouwershaven church, when you may anchor in 7 or 8 fathoms, in Brouwershaven Road, south-eastward of the Hompel-voet.

On working into Brouwershaven Gat the lead must be the principal guide, as marks on either side are scarcely distinguishable. Within the outer black buoy the long narrow ridge of the Ooster will be on the north side. For about two miles within this buoy the bank is steep, and no ship should approach it to a less depth than 4½ fathoms. So soon as the light towers bear S. by W. the water on this ridge deepens, and continues, for a considerable distance, to have 13 or 14 feet, so that vessels of a suitable draught may approach or even cross it, until they get so far as to have the steeple of Burgt on with the Wester Doodkist, the first sand-down to the eastward of the low land.‡ With this mark you will be near the west end of a shallow and steep knoll, of less than 5 feet, called the

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* The light-towers (*Vuuren*) in one bear S.S.E. One stands on the easternmost part of the sandhill; the other near the shore. The hill or ridge is called the *Vuurvoet* or *Fire-foot.*

† This is a cluster of high trees to the westward of Schaarindyk, about 2½ miles below or to the westward of the entrance of Brouwershaven.

‡ The church of Burgt is two miles to the N.E. of the S.W. extremity of Schouwen.

Droog Hompel, and lying to the northward of the second black buoy. Large ships may approach all this part to 4 fathoms or less, according to their draught and the time of tide.

Should the black buoy happen to be removed, the steeple of Brouwershaven must not be brought to the northward of Beukelaar until Renesse bears South; and then to avoid the Middelplaat, Brouwershaven steeple must not be opened to the northward of Kloosternolle, till Elkerzee steeple appears to the eastward of Beukelaar, which will clear its east end.* With this mark a vessel may stretch in over the flat, between the east point of the Middelplaat and the west point of Hompelvoet, where there is from 21 to 25 feet of water. If necessary, you may anchor in 3½ fathoms, near the Middelplaat, with Elkerzee S. ¼ E. or South to the eastward of Beukelaar, and Brouwershaven steeple on the middle of the Langen or Long Dyke.

On proceeding eastward, when Elkerzee comes on with Kloosternolle, you will be nearing the west point of the Hompelvoet, the south side of which is very steep, and soundings not to be trusted. There is no mark for avoiding it, but as the bank is very shallow, it mostly has a ripple on the surface, especially near the point, which, when seen, may be a sufficient guide.

On standing to the southward, from the outer black buoy, the North Banjaard, which in some parts is steep-to, should not be approached to a less depth than 4 fathoms; the two *white buoys* will point out the edge of the bank, but, in case of their removal, you may stand toward the bank with the lead going until the steeple of Renesse comes on with the Easter Doodkist.

When above the second white buoy, or when the light-towers bear S.S.W., the soundings toward Schouwen are more regular, and the bank may be approached according to the vessel's draught.

When the steeple of Renesse bears S. by E. you will be near the Schaar, where the channel is very narrow. To avoid the Schaar, on the north side, the steeple of Brouwershaven must be kept in sight to the northward of the trees of Beukelaar, until Renesse steeple bears S. by W. You will then have passed the Schaar, and may stand to almost a ship's length from the shore till past Kloosternolle, where the Langen Dyke commences, which must not be approached so near, and particularly the Ossenhoek, from which extends the rocky bank which has been described.

For the *Springer's Diep* and other channels to the eastward, see the preceding description.

GOEREE GAT to HELLEVOETSLUYS.—Goeree Gat, in latitude 51° 49′, is formed by the extensive bank called the *Hinder Bank*, on the north side, and the north coast of Goeree on the south. There is a bar at the entrance, from side to side, on which there are only 15 or 16 feet at low water; but, within, the water deepens. The best water is on the side next Goeree; this side being steep: but, on the Hinder side the water shoalens gradually.

The Hinder Bank stretches in a curve nearly East and West, about 6 miles in length. Its west point lies with the west point of Goeree island S. ½ W., distance one mile. Upon its eastern side lies the channel called the *Quax Deep* [*Quaksche Diep*] which lies between it and the West Poel or Plaat of Voorne Island, a shelf which stretches off from the west end of that island. This passage is narrow and shoal, therefore fit for small vessels only.

There is a patch near the middle of the Hinder Bank, called the *Steile Hinder*, which dries at half-ebb. It is about a mile in length, and lies nearly a mile and a half from the shore of Goeree. From its west end Goeree church, S. by W., appears on with a clump of trees called the *Steurboschje*. About a mile farther eastward is another patch, the *Ribben*, which is half a mile long, and dry at low water: it lies about a mile and a quarter from the Island Voorne, and west a little northerly from Rokanje church, which stands at half a league within the western point of that island. On the other parts of the Hinder bank are from 2 to 12 feet, and to the westward of it the depths increase gradually to 4 and 5 fathoms. Along its S.W. and South sides are two long and shallow patches called the Bol or Hompel and the Tonne Plaat.

Goeree Gat [*Goedereesche Diep*] is marked by *seven black buoys*, numbered 1 to 7, on the north side, and a white buoy on the south. The outer black buoy, No. 1, lies in 3 fathoms, with Zierikzee church steeple S. ½ W. just clear of Goeree sand-hills, and Goeree church [Goedereede] S.E. by E. ¾ E. a little open to the northward of the Houten Kaap or Stone beacon near the shore.

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* *Elkerzee* is a mile from shore, within Schaarendyk, and 2¼ miles west from Brouwershaven.

The *black buoy*, No. 2, likewise lies in 3 fathoms, in the latter line of direction, at the distance of five-sixths of a mile; and No. 3, in 4 fathoms, on the edge of the Bol or Hompel, bears E. ¾ S. one mile from No. 2, and lies at nearly half a mile N. ½ E. from the Houten Kaap or Stone beacon: the others lie nearly parallel to the shore of Goeree.

The *white buoy* on the south side of the channel lies on the extremity of a shallow spit extending from the shore. It bears about S.E. from the third black buoy, and N.E. ½ N. from the Houten Kaap or beacon.

The Bar, above-mentioned, extends from without the outer buoy to within the second buoy. Within the bar the depth of the channel is from 4½ to 7 fathoms, but it is little more than a cable's length wide abreast of the third black and the white buoy, and also abreast of the buoy No. 6, and not more than twice that breadth in any part.

Eastward of *Kwade Hoek*, off which a shallow spit extends, the channel takes a S.S.E. and S.E. direction to beyond the entrances of Goeree canal, Stellendam, &c., where it is called the Zuyder Diep. To the N.E. this channel is limited by a long shoal in continuation of the Hinder Bank to the S.E.: this bank is called the *Pampus*, and the N.W. part the *Scheel-hoek*: the S.E. extremity is the *Slyk Plaat*, which dries to a considerable extent.

Between the Scheelhoek and the Hinder Bank is a swashway which serves for crossing over from Goeree Gat to Hellevoetsluys. Between the S.E. end of the Scheelhoek and the Slyk Plaat is another swashway, but with less water; and to the southward of the Slyk Plaat is a narrow passage between it and another bank, called the *New Passage*.

DIRECTIONS for proceeding to Hellevoetsluys.—On approaching Goeree Gat, otherwise called the West Gat, from sea, so soon as Goeree church is seen, bring it to bear S. by E. and steer toward it in that direction till the Houten Kaap or beacon tower comes in sight: then bring the church and beacon in a line, bearing S.E. by E. ½ E., and in that direction they will lead to the outer buoy No. 1. When the church of Zierikzee, in Schouwen, appears close to the outermost sand-hills of Goeree, or if the weather be hazy when those sandhills bear S. ½ W., the vessel will be within the Ooster Bank, in 2¾ fathoms. In order to avoid the north side of the Ooster, Goeree church must not be brought but little to the southward of *Jan Pouwlus' house*, which stands a little to the S.W. of the Houten Kaap. In order to clear the Bol, on the other side, off the western extremity of the Hinder, Goeree church must not be brought to the northward of the Houten Kaap.

Having arrived to the outer buoy, the course to abreast of the second or buoy of the Bol will be about E.S.E., and afterward nearly E. by S. observing to pass between the third black buoy and the white one; and that all the black buoys are to be left on the larboard side.

Opposite the Houten Kaap the banks are little more than a cable's length apart, and in some places very steep; so that, should the buoys by accident be removed, all skill and vigilance will be required, in threading, by the lead, so narrow a channel. The course continues about E. by S. and in approaching the stone beacon the water deepens, and the jetty-heads or groins along the shore may be more nearly approached until Goeree church comes in a line with the third jetty, reckoning from the east, when it will be necessary to haul gradually to the northward in order to clear the spit which projects a quarter of a mile from the Kwade Hoek, as well as because the flood-tide sets strongly upon the shore.

In order to sail over the Pampus to Hellevoetsluys, having brought Goeree church in a line with the high down or sand-hills near the entrance of Goeree canal, steer S.S.E. ½ E. into the Zuyder Diep. The channel-way thence has recently changed, and cannot at present be correctly described; but having crossed until Oudenhoorn church disappears behind the houses of Hellevoetsluys, an E.S.E. course may be safely taken, in a direct line for Hellvoet Road or Harbour.*

QUAX DEEP or North Gat to Hellevoetsluys.—This passage, between the Hinder Bank and West Plaat, has been already mentioned. It is regularly buoyed, with black buoys on the East, and white on the west side. The west Plaat extends 3 miles north-westward from Voorne Island, and forms the N.E. side of the Gat. This bank has no where less than two fathoms on its edge, whence it shoalens toward the shore, at about half a mile from which is a patch, called *Zeehonden Plaat*, a mile and a half long, which dries at half ebb: its south end lies about N.W. ½ W. from Rokanje church.

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* *Oudenhoorn* is 2½ miles to the eastward of Hellevoetsluys, at a mile and a half from the nearest shore.

The entrance of the Gat, between the West Plaat and Hinder Bank, is about half-a-mile wide, with 2½ fathoms of water. It is distinguished by a black buoy with a vane, marked N.G. (Noorder Gat) No. 1, on its N.E. side, and a white buoy, No. 1, on the S.W. side.

The outer black buoy, No. 1, lies N.W. ½ N. from Rokanje church, and its mark is the *Steurboschje* between Goeree church and mill bearing S. by W. The white buoy, No. 1, lies two-thirds of a mile S.W. by W. ¾ W. from the black buoy. The interior of the channel has two other black buoys on the east, and two white ones on the west side.

The black buoy, No. 2., lies 2⅔ miles nearly S.S.E. from No. 1, with the Brielle church E.S.E. ⅔ E. in a line with the Pest house. From this the black buoy No. 3, lies S.S.E. ¼ E. 2¼ miles. The last buoy is less than half a mile from the strand of Voorne, and its thwart mark is the Brielle church a quarter of a point to the southward of Rokanje church, bearing E. ½ N.

From the *white buoy*, No. 1, the white buoy No. 2 lies S.S.E. ¾ E. one mile and a third; its mark is, Goeree church S. by W. ½ W. on the Kroonboom. From the second white buoy the third bears S.S.E. ¾ E. one mile and three quarters, and lies near the north end of the Ribben, at half a mile south, a little westerly, from the second *black* buoy, with Goeree church S.W. by S. on with the third jetty, counting from the eastward. Here is the narrowest part of the channel, it being only one-fifth of a mile wide, with depths of 5 and 6 fathoms. At a mile and three quarters farther in, abreast of the third black buoy, it is nearly half a mile wide, with a depth of 3 fathoms; its direction is S. by E. ½ E. to abreast of de Kwak, and then S.E. by E. to the road of Hellevoetsluys.

DIRECTIONS for the NOORDER GAT, otherwise *Quax Deep.*—On standing in from sea, bring Goeree church to bear S. by W., and this bearing will lead to the outer black buoy [N.G. with vane]. The marks for entering the channel are the church and mill at Hellevoet two degrees (by quadrant), open to the northward of the Boschje or grove of Scheelhoek.* With this mark run in about S.S.E. ½ E. to abreast of the second black buoy, or until the Brielle church comes in a line with the Pest house. Here the channel begins to deepen, and soon after becomes very narrow, with steep banks on both sides, so that, should the buoys be accidentally removed, all precaution must be observed.

The course hence will be S.S.E., which gradually brings Hellevoet church and the Scheelhoek Boschje nearer together, so that they will be in a line when the church of the Brielle and that of Rokanje are in one, which is the thwart mark for the third black buoy: Now steer S. by E. ½ E. taking for the leading mark a clump of trees at the point of Stad,† which must be kept open to the northward of Pieter beacon. Off De Kwak extends a spit of sand called the Schaar, which may be avoided by keeping the Hoornsche Hoofden well open to the southward of Hellevoet pier.

MAES MOUTH. [MOND VAN DE MAAS.]—The entrance of this river, in latitude 51° 55′, lies between the north side of Voorne and the Hoek or Hook of Holland: it is a mile and a quarter wide; but an extensive middle ground, the Maas Bank, forms two channels, one on the north, the other on the south. The latter is the *Brielsche Diep* or *Brielle Gat*, a shallow swashway, bounded by Voorne Island. The bank is composed of shifting sand, which frequently alters by gales of wind.

A black buoy marks the entrance of the Gat on the eastern side, and lies in 9 feet of water on the Maas Bank, and a buoy, painted *black, white, and red*, lies in a similar depth, on the N.E. part of the West Plaat of Voorne, at half a mile W. by S. from the outer black buoy. Along the eastern side of the West Plaat are smaller tri-coloured (black white and red) buoys.

The outer black buoy lies two miles from the N.W. part of Voorne, with the Brielle church, bearing about S.E., a ship's length to the N.E. of Oostvorne church; Rokanje church S. ½ E., half a point eastward of the Pest-house; and Munster church about

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* *The Boschje of Scheelhoek* is a small wood, the only one upon the southern part of the island Voorne. It may be readily known by its having a vista or opening in the middle, by which it appears like two clumps.

† STAD is a village just showing above the horizon in a S.S.E. direction.

E.N.E., appearing through a square opening in the duins or sand-hills upon the Hoek of Holland. Other black buoys are placed along on the Maas Bank, which are, on going in, to be left on the larboard hand, but they are occasionally shifted.

Through the Gat there are, generally, about 7 or 8 feet of water, with ordinary low ebbs; but within, in what is called the *Pit*, the depth increases to 3 or 4 fathoms; and the channel is about a quarter of a mile wide between the strand of Voorne and the *Binnenblakte*, a sand which dries and takes an E. ¾ S. direction till about midway between *Zeeburg* and the Stone beacon, where it turns off E.N.E. between the South and North Banks, the former with *black*, and the latter with *white* buoys along its edge: here it becomes very narrow, and following the direction of the Zuid or South Bank, changes to the E.S.E., S.E., and South, and thence S.S.W. between the *Krabbe Plaat* and the shore, and lastly South to a harbour light at the entrance of Brielle Haven.

On standing in from sea, for the Brielle Gat, bring the Brielle church to bear S.E. ¼ E. If kept on that bearing it will lead to the outer black buoy on the eastern side of the entrance, the western side, as described above, being marked by one painted black, white, and red, within which are the others of the same description. Should these be gone, if obliged to borrow on that side, be careful not to bring Rokanje church in Voorne to the westward of the Pest-house.

In sailing up, the black buoys are all to be left on the larboard side, and the tri-coloured ones on the starboard. Having entered within the two outer buoys, the Brielle and Oostvoorne nearly in one will lead safely into the *Pit*, where the shore is bold; but the Stone beacon must not be brought in a line with Zeeburg.

Having passed Zeeburg, haul off from the strand and stretch over for the first small black buoy, (called by the Dutch a *Joon*) which lies off the point of the Noord Bank, and run thence into the Zuid Bank Channel by keeping all the large buoys on the starboard, and the smaller ones, or *Joons*, on the larboard, side. The course through the Zuid Bank Channel is E.S.E., S.E., S.S.E., S.S.W. and lastly South, to the harbour light at the entrance of Brielle Haven.

BRIELLE or BRIEL was the birth-place of the heroic admiral *Van Tromp*. Its harbour is spacious and secure, and the population, for the most part, are fishermen, pilots, and persons in occupations connected with their maritime position. The town, though small, is handsome, well built, and strongly fortified. From Brielle to SCHIEDAM, on the north side of the Maes, the distance is nine miles, and to ROTTERDAM, higher up, on the same side, 12 miles.

RIVER MAAS *or* MAES *to the* TEXEL.

THE TEXEL ISLAND lies 22½ leagues N.E. ½ N. from the mouth of the Maas or Maes: all the land between is low and level: and the coast is so clear, that you may run along it all the way, in 4 or 5 fathoms of water. The land, contiguous to this part of the coast, is distinguished by the following towers, churches, and steeples:—

First, is the church of Gravesande, noticed on page 151. At a little to the northward of Gravesande, is a square steeple, with a small turret on it; by the shore, abreast of this steeple, is a white hill, which appears higher than the other land: and, at 7 miles to the north-eastward of this sand-hill, is *Scheveling*, a small fishing-town, with one church and a small spire-steeple: the land, near this place, appears in hummocks: Scheveling, when approaching it from the sea, may be known by several spire-steeples together; they belong to the Hague;* and one of the largest is square, with a spire on its top.

At 6½ miles north-eastward from Scheveling, is the town of *Katwyk*, standing close to the shore, and having one large church, with a small spire-steeple. To the southward of this church stands a beacon, which appears, from sea, like a steeple. Rynburgh and Valckenburg (inland) have spire-steeples. The land, near the shore, is full of sand-hills, which, at a distance, appear in hummocks. At a league to the north-eastward of Katwyk, is *Nordwyk;* having a square steeple, with a small spire on it: and near this church, stands a fire-beacon.* The hummocks on the land here appear somewhat higher than those to the southward. At a mile to the south-eastward of this Nordwyk, which is called *Nordwyk-op-Zee*, is *Nordwyk-in-Land;* the latter has a church, with a square steeple, and a light-beacon on it; and also a small tower, standing on the middle of the church. Eight miles and a half to the northward of Nordwyk is *Zandvoort,* with a tall spire-steeple and a light-beacon: when you are abreast of it, you will see a large house, with a barn close to it; and to the southward of it you will see a little hummock, which appears like the top of a beacon. The land here, as in other parts of the coasts, appears in hummocks.

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* GRAVENHAGUE, or the HAGUE, is less than two miles south-eastward of Scheveling.

At 3 leagues to the northward of Zandvoort is *Wyk-op-Zee;* it has a church with a square steeple, a light-beacon, and a sand-hill close by the shore, which appears higher than any of the other land thereabout. When the steeple and this sand-hill are in a line with each other, the former seems to stand on the latter like a lighthouse.

The land between Zandvoort and Wyk-op-Zee appears double, with white sand-hills, and is somewhat higher than the land to the southward. It may be known, when coming in from sea, by Haerlem church, which stands at a league to the east of Zandvoort, with a spire-steeple in the middle of it; it is also distinguishable by Beverwyk, which is 2 leagues to the northward of Haerlem, with a spire-steeple, which is high and somewhat bluff.

Six miles and a half to the northward of Wyk-op-Zee, is EGMOND-OP-ZEE, having a bluff square steeple, and two light towers, standing close by it. Here the land is low, with here and there a hummock. This part of the coast is distinguished by three spire-steeples, standing in Egmond-in-land, one of which is larger than either of the other two.

In October, 1834, the two old coal-fires of Egmond-op-Zee were replaced by two bright and fixed reflecting lights. Of these lights, placed on towers erected for the purpose, the northernmost is 27½, and the southernmost 28½ yards above the ordinary level of the sea. They stand in the direction of N.N.W. ½ W. and S.S.E. ½ E. from each other, at the distance of 232 yards.

About 4 miles to the northward of Egmond-op-zee, is *Camperdown.* This is the highest land on the Dutch coast; it being a large sand down, having its summit in latitude 52° 41½′; the Down, at a distance, appears in hummocks, and may be seen, in clear weather, when in 14 fathoms of water, at the distance of 20 miles. Ships bound to the Texel, from sea, should endeavour to make this land; and, having made it, may safely stand toward the shore, into 6, 5, or 4½, fathoms, only avoiding a shoal, of 2 fathoms, called the Polder, which lies 3 miles to the northward of the little fishing-town, called Petten.

The next remarkable eminence, to the northward of Camperdown, is KYKDOWN, a high white sand-hill, with a fort and lighthouse upon it, at the southern side of the entrance of the Texel-stream. It is, consequently, requisite, that those who are unacquainted with the coast should be cautious of not mistaking the latter for the former; especially as, between Camperdown and Petten, or the downs of Callands Ogh, the land is so low as to form the appearance of a spacious harbour.

The little town of Petten, to the northward of Camperdown, appears in hummocks, having several houses and mills upon them. It has, also, one church with a spire-steeple, which appears, when viewed either from the northward or southward, like a barn; but to those abreast of the town, the steeple appears as if standing on the middle of the church. Close to the town is a sand-hill, upon which is a large building, having the appearance of a lighthouse.

The land between Petten and Kykdown is full of sand-hills, appearing at a distance, in hummocks.

The present LIGHTHOUSE on KYKDOWN was erected by order of his Majesty, the King of the Netherlands, in 1822, in lieu of the old coal-fire light kept there. From an opening, ten feet wide, to seaward, it now exhibits a strong reflected light, at about 55 feet above the sea.

The land of the Texel is low, and also appears, at a distance, in hummocks. On the island are four churches, of which three have steeples. The other is without a steeple, and is covered with blue slating.

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* The Beacons of Scheveling, Katwyk, and Nordwyk, exhibit temporary lights only, for the use of the fishery.

DIRECTIONS *for the* TEXEL.

The southern entrance of the Texel bears East, distance 124 miles, from Orfordness; S.E. ½ E. 54 leagues from the Humber; and S.E. ¼ S. nearly 60 leagues from Flambro' Head.

It is here to be observed that, the sands named the Haaks are steep-to, and very dangerous. In rounding them vessels should never approach nearer than in 12 fathoms, or than just within sight of the land of the Texel.

The southern passage into the Texel, between the Haaks and the Helder, is named the *Schulpe Gat.* This channel is narrow, but is regularly buoyed, and the buoys are occasionally shifted, according to the shifting of the sands. With a weather-going tide, there is a dreadful sea upon the Haaks in a gale.

From the survey of the channels of the Texel, it appears that the Schulpe Gat, or Southern Channel of the Texel, is now marked out by six black buoys, placed on the edge of the Haaks, on the western side, and one white buoy, on the eastern side of the bar above Kyk-down. The outer buoy lies in 2½ fathoms, with the Vuur-plaat or Look-out of Kyk-down N.E. by E. 3½ miles; the second buoy bears from it, N.E. ½ N. three-quarters of a mile; the third from the second, N.E. ¾ N. a little more than that distance; the fourth from the third, N.E. ¾ E. one mile; the fifth from the fourth, N.E. by E. ¾ E. two-thirds of a mile; and the sixth from the fifth, E.N.E. at nearly two-thirds of a mile. The *white buoy* lies on the bar, E. by N. from the latter, at about one-quarter of a mile; and between is a depth of 14, 15, 21, 17, and 25, feet at low water.

On the high land to the east of Kyk-down is a large beacon, called the Schouten Kaap or Schouten Beacon; and on the lower land, upon the edge of the coast, is the Kleine Kaap, or Lower Beacon. These beacons in a line, bearing S. 8° W. (by compass) form the mark for the outer buoy of the North Gat.

The lower beacon, N.E. 8° E. just open, on the west of the Lookout of Kyk-down, is the mark for the entrance of the Schulpe or South Gat; and the best water thence is toward the buoys on the larboard side. Having then crossed the bar between the sixth black and the only white buoy, you haul to the eastward for the Texel Stroom, which will be directly open.

There is good riding with the land of the Texel trending from N. to N.E. The common anchorage is to the eastward of the Fort, as shown on the Charts.

Large ships cannot leave the harbour by the Schulpe Gat, unless the wind prevails from some direction between the North and East by South.

New or North Gat.—The north channel into the Texel is called the north Gat; small vessels from the northward commonly enter by this channel, which lies between Keysers-flat and the Hors, and is, in time of peace, regularly buoyed. The entrance is shoal, and the passage nearly two leagues in length; strangers should not venture without a pilot. The course in is about S.W. ½ W., rounding to the road, to the eastward, as above described.

Texel Roads.—With a strong wind to the West or W.N.W. there is always a heavy broken sea in the Texel, and the ground is, in general, bad. The safest way is, therefore, to come-to in deep water, 10 or 11 fathoms, before getting on the bank, as here the ground is best, and you will have to drag upwards. But, by coming-to, on the high ground, which is loose, you may drive off again into deep water, and on shore, before it be possible to bring up; the ground being soft mud.

The GRAND CANAL, which was completed a few years ago, under the auspices of the King *William I.*, was constructed for the transition of large vessels from Amsterdam to the sea, and from the sea to Amsterdam: it extends from the Helder to that city, by Alkmaar and Purmerende, as shown in the charts. In the road fronting Amsterdam are 40 feet of water; but on the *Pampus*, or Bar, seven miles below, is a depth of only 7 feet. Large vessels here have, therefore, to unload part of their cargoes into lighters before th can enter the port. The *Zuyder Zee* is generally shallow and unfit for the navigation of large vessels; and hence the canal derives its importance. The distance between the two extreme points is 41 English miles, but the length of the canal is 50½ miles: the breadth of the water on the surface is 124 feet; the breadth at bottom is 36 feet, and the depth 20 feet 9 inches. Like the Dutch canals in general, its level is that of the high spring tides in the sea, from which it receives its supply of water. The canal requires and has only two tide-locks, one at each of the extreme points; but there are two sluices besides, with a flood-gate in the intermediate space. It has 18 draw-bridges. The locks and sluices are double, that is, two in the breadth of the canal; these are built of brick, with bands of limestone at intervals, projecting out about an inch beyond the brick, thus protecting it from abrasion by the sides of the vessels passing. A broad towing path is on each side, and the canal is wide enough to admit of one frigate passing another.

The canal takes its course from the *River Ye*, directly opposite to the city; first running nearly *true* north to Purmerende, then N.W. to the Lake of Alkmaar, then again north by Alkmaar to a point within two miles of the coast near *Petten*, and thence in a curvilinear direction to the Helder, where it unites with the *Nieuwe Diep*, an excellent harbour. At this place is a powerful steam-engine for supplying the canal with water, during neap-tides, and for other purposes.

The time spent in tracking vessels from the Helder to Amsterdam is commonly 18 hours. Immediately opposite to the Helder are 100 feet of water at high tides, and at the shallowest part of the bar to the westward are 27 feet: at the port are 40 feet of water, while above and below it are not more than 10 or 12 feet. To vessels leaving Amsterdam, which formerly were detained, by adverse winds, in the Zuyder Zee, ofttimes for weeks, the canal must prove extremely advantageous.*

TIDES *between* CALAIS *and the* TEXEL.

The flood-tide which sets to the northward and eastward of the French coast, appears to be a branch of tide from the English Channel, which, therefore, rises progressively later as it sets to the eastward.

At Calais, and thence to Nieuport, it flows, on the full and change days, at half-past eleven; Harbour of Nieuport, three-quarters past eleven; at Ostend, at half-past twelve: but the stream in the offing runs three hours longer than the time of high water on shore. At Blankenberg it flows at 12 h. 20 m.; at the Raan, near the Western Scheld, at 12 h. 45 m.; at Flushing, 1 h. 20 m.; in the Oost Gat of West Cappel, 12 h. 15 m.; at Veere, or Campveer, 1 h. 30 m.; at Brouwershaven, 2 h. 0 m.; in Goeree Gat, 1 h. 45 m.; at Goeree, 2 h. 0 m.; Hellevoetsluys, 2 h. 15 m.; Brielle and Hoek of Holland, 3 h. 0 m.; Egmond-op-Zee, 4 h. 30 m.; Entrance of the Texel, 6 h. 30 m.; and Texel Road, 7 h. 30 m.

The perpendicular rise of spring-tides, in feet, is nearly as follow:—Calais to Nieuport, springs 15 to 18, neaps 14: Ostend, springs 17, neaps 13 or 14; on the Flemish Banks, springs 16, neaps 12; Mouth of the Scheld, and off West Cappel, springs 18, neaps 12; at Flushing, Veere, and Brouwershaven, springs 13 to 10, neaps 9 to 7; Goeree Gatway, springs 12, neaps 8; at the Brielle, springs 10, neaps 6; Egmond-op-Zee, springs 12, neaps 8; at the entrance of the Texel, springs 16, neaps 11; in the Texel Road, springs 7, neaps only 3½, feet.

The fair stream of the tide among the banks off Flushing is E.N.E. and W.S.W.: the tide which sets to the eastward being called the flood, and that to the westward, the ebb. It flows, by the ground and in the harbour, at 1½ on full and change, and 5½ by the stream; so that the last four hours of what is called flood by the stream, runs whilst the water is actually falling on shore.

At and about Ostend the tide is about an hour earlier; and, with lifting tides, the flood generally runs longer than the computed time; and, with falling tides, a shorter time.

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* It seems probable that, at some future time, a harbour, worthy of the name, may be excavated on the south of the village of *Petten*, having a branch communicating with the Grand Canal, and thus materially facilitating the inland communication to and from the capital. *As a Harbour of Refuge*, for vessels on the coast, its value would be incalculable, could the formation of a Bar, by the operation of the sea, be prevented. This hint is submitted, with deference, to those who are best acquainted with the locality, &c.—J. P.

The stream of flood, from E.N.E., appears to run its course very truely, until an hour before low water (by the stream), when the harbour-flood running strong, the stream draws in from N.E., until it changes to the flood.

The flood, by the stream, here runs very truely from W.S.W., until the time of high water in the harbour; when, with the first of the harbour ebb, it draws round, and sets out about an hour from the S.W., and still draws gradually round to S.S.W. and South, whence it has a strong drain, of nearly a knot, until three-quarters of an hour after the ebb should have made in the stream, to which the ship swings gradually, the current of the tide never being at a stand.

Spring tides here run 1¾ or 2 knots, and neaps 1 or 1¼ knot. The drain, from the southward, is felt outside the banks, and is of great service when obliged to carry sail, or work on.

At the East Gat of West Cappel the tide sets as follows:—The first of the flood sets to the southward, and the middle and after-parts right inwards, through the East Gat; the first of the ebb sets very strongly to the northward, and the middle and after-parts set right out through the east entrance. When the flood begins to run at sea, it is the first of the ebb in the East Gat; and when the ebb begins to run at sea, it is the first of the flood in the east entrance.

At the outer buoys of the Deurloo Channel, the first of the flood sets strongly to the southward, the middle part S.E., and the latter part sets right in, through the channel; the ebb sets in contrary directions. In Flushing Road, the current runs up three quarters of an hour after the time of high water in the harbour.

Off Goeree Gat the stream continues to run, in the offing, until half-past four. Soon after the flood has begun to run without the Gat, it begins to run into the same.

Before the Banks of Schouwen and Goeree the tide turns about with the sun. The after-flood sets into the channels, and then bends to the southward till the running of the ebb. But the ebb runs right out to sea, and the young flood sets a short time to the northward.

By attending to the current, when off the coast of Holland, in calm weather, and out of sight of land, it may easily be perceived, whether to the northward or southward of the Maes. For, to the northward of the Maes, the stream of flood turns about with the sun; but, to the southward, it turns about against the sun, till the last quarter tide, and then sets toward the land.

A little before half-flood the stream sets directly into the Texel; and, from about half-ebb to half-flood, it sets directly out. But the first of the flood, with the latter part of the ebb, sets nearly N.N.E. over the banks, and out of the Spaniard's Gat; and the latter part of the flood, with the first part of the ebb, sets nearly S.S.E. over the south bank, till nearly half-ebb.

Along the coast of Holland, with the wind to the southward of west, there is no assistance from the ebb, in turning toward the Maes, or beating to windward; because, with such winds, there is no ebb running by the shore.

Of the TIDES *at the Entrance of the* SCHELD, *the following Description has been given by* CAPTAIN J. C. RYK, *of the Dutch Royal Navy.*

The average rise of the water on the quarter days at *Flushing* is 9 feet, and at spring tides 12½ feet; but it is so much affected by the strength and duration of different winds, acting on the two great streams which come through the English Channel and round the north of Scotland, that no satisfactory results have yet been deduced from the registers of the rise and fall, though they have been accurately observed every half hour for a considerable period.

Without any material error, however, the rise of the water, at ordinary tides, may be stated thus:—First hour of flowing, 1 foot; second, 1 ft. 4 in.; third, 1 ft. 7 in.; fourth, 2 feet; fifth, 3 feet; sixth, 1 ft. 7 in.

And at ebbing, it falls—in the first hour, 1 foot; in the second, 1 ft. 7 in.; in the third, 2 ft. 4 in.; fourth, 3 feet; fifth, 1 ft. 7 in.; sixth, 1 foot.

On this part of the coast the phenomena of the tides are very irregular, when compared with what has been observed farther north on the Dutch coast; here, for instance, they revolve in a direction opposite to the sun, whereas to the northward of the *Old Stone Beacon* of *Goeree* they follow its course.

The different directions which the tides take from hour to hour, are, nevertheless, of such importance to every vessel running in among the banks, or making for a harbour, (the reaching or not reaching of which may entirely depend on this knowledge,) that I shall now endeavour to give a concise description of them.

In order to have a general point of comparison, we may take the time of high water at Flushing, as being best adapted for that purpose. By reckoning in the usual manner, it may be ascertained how many hours have elapsed since the last high water *there* at the time designated.

Outside the banks, in the open sea, the general flood-stream runs E.N.E. and the ebb W.S.W.; and the reader will remember that, when speaking, in this description, either of the direction of currents, courses, or bearings, the *magnetic compass* is always to be understood. There, as well as outside the gats, or entrances to the channels, the after-flood, as it is called, begins two hours before it is high water at *Flushing*, and runs about E.S.E. for the Walcheren coast, until it is high water. The stream then bends away from the coast, so that, at one hour after high water, it will have a N.E. direction; at two hours after high water at Flushing, it will run N.N.E.; and at the 3d hour after high water, or at half ebb at Flushing, due north. The rotation then accelerates till the 4th hour, when it attains a W.N.W. direction, and it is then said to be low water at sea.

During the two following hours, till the time of low water by the shore, it is slack water on the Steen bank and off the gats, and the stream runs W.S.W.; so that from the beginning of the ebb at sea, until the next flowing tide, the current will have run round 16 points of the compass against the sun.

With the flowing tide, the rotation proceeds in the same direction, so that at the 7th hour after high water (always at Flushing) the current runs S.W.; at the 8th, S.S.W.; at the 10th, E.S.E.; at the 11th, east; and at the 12th hour, or second high water, E.N.E. again; having thus, during the six hours of the flood, run through the remaining 16 points of the compass, against the sun; so that a vessel at anchor, in a calm, would, in the course of the ebb and flood tides, have turned her head to all the points of the compass; but it is proper to remark that the stream changes its direction quickest near the entrances of the gats.

On the *Steen or Stone Bank*, the same rotary direction takes place, though just within it, in the Steen Diep, the tides run more regularly, preserving an E.N.E. and W.S.W. direction, with an interval of slack water between them; which is not the case with the above revolving streams, as they continue to run without intermission.

IN THE WIELING the fore-flood runs in-shore in a southerly direction, as the finished ebb bends round against the sun; and is, at times, so strong, that ships coming in, close-hauled on the larboard tack, are frequently obliged to anchor on account of it, until the tide, turning farther round, runs inward in the direction of the channel, which, as before stated, takes place much earlier than at sea.

The water attains its utmost height at Flushing, an hour before the stream has done running up, so that it is about an hour and a half after high water at that place, before the ebb begins regularly to run down to the different gats. It then runs in a W.N.W. direction to the *Wieling*, uniting itself with the ebb which runs out from before *Hoogplaat*, in a north-western direction. When as far as the *Wulvischstaart*, the ebb runs more seaward, from W.N.W. to N.W., falling over that bank, and the earlier the time, the more northerly its direction: it is the same over the Rib Sand, further down in the Wieling. With southerly winds, this northern set of the ebb must be attended to carefully when passing the little bank of *Cadsand*, and the *Paarde-markt*, especially when sailing by the wind out of this channel. The northern tendency of the tide continues until it is low water in the gat, when the current runs straight out of the *Wieling*; but soon after turns inward toward the shore, as far as S.W., and runs still longer farther to the westward; so that, west of the *Sluissche Gat*, it ebbs 1 hour; before *Heyst* 2 hours; and off *Blankenberg*, 3 hours longer than at Flushing, thus affording outward-bound ships the advantage of always having long ebbs.

On comparing this longer running of the ebb before *Blankenberg* than before *Flushing*, with the circumstance of high water being earlier before the former place than the latter, and, consequently also low water, there seems to be a discordancy, which can be explained only by the rotary motion of the tides; thus when it is low water at Flushing, or 6 hours after high water, the current runs W.S.W.; the 7th hour, S.W.; the 8th, S.S.W.; and the 9th, south; when it may be considered that the tide is just beginning to run in, although the depth of water has been increasing for nearly three hours. The farther inward, the more the banks destroy the effects of the rotation, and, therefore, the more regularly the stream runs.

THE DEURLOO.—Outside this channel or gat, the rotary movement of the tides takes place as already described. A laden ship, wanting to get into this channel, with northerly winds, should wait at least till nearly half tide, or nine hours after the last high water at *Flushing:* because the first of the flood runs strongly round to the south, and it is only 2 hours before high water at Flushing that the flowing tide runs right into the Deurloo.

This difference in the course of the tide, is the reason why ships sailing with the ebb, under a press of sail, from the Deurloo, can profit by that ebb no longer than 4, or at the utmost 5, hours, as the tide, continuing its rotary motion, will then again be running to the S.W., and setting direct upon the Raan.

The ebb runs from *Flushing Road* to the Deurloo, N.W. and N.N.W., at first following the direction of the banks, as far as the 1st and 2d black buoys coming out: but there, when the water has been falling 2 hours at Flushing, the ebb assumes a more northerly direction, as it does on the Wieling, and sets over the bank of Soutelande and the *Rassen,* till it is low water in the *Deurloo;* when the tide begins to run nearly west, and so changes about to the south. But, contrary to what takes place in the *Wieling,* where, the farther to the westward, the longer the water ebbs; here it will be low water at the outer buoy of the *Deurloo* one hour earlier than at Flushing.

THE OOST GAT.—In this gat, off Westcappel, the tide-streams revolve in every respect the same as they have been stated to do at sea; and within the Mill of Westcappel, the first flood, and the flood in general, runs about south. The flood, or rather the entering of the water, on the north side of the *Westcappel dyke,* or near the *Kaaphuisje,* begins 2 hours before it is low water at Flushing; while, on the opposite side of the gat, by the *Rassen,* the ebb stream, at low water, runs west and W.S.W. From *Flushing road* to near the corner of the dyke, or to *Westcappel mill,* the ebb follows the direction of the coast, but always inclining toward the shore, as if pushed in by the Deurloo ebb, which sets over the bank of Souteland; and quite the reverse of the flood, which, from *Westcappel mill* inward, recedes from the strand, and runs southerly.

This division of the subject may be concluded with the following general remarks:—The ebb, which runs down the Scheld, and that which comes through the Sloe, and passes over the Kloot, unite off Flushing. Below that town, where the shores widen on either side in the shape of a funnel, the stream diverges into various channels, which advance toward the different gats; while on the intermediate banks, the stream diminishes in strength in proportion to their lesser depth, and consequently accelerates in the channels.

On the *Banjaard,* the flood-stream runs out to sea, and the ebb sets on the shore.

In the VEERE GAT the tides run straight in and out, being hemmed in by flats; and the ebb, uniting at *Onrust* with that which runs out of the East Scheld, runs along by *Oostkappel* and *Domburg;* where it is again joined by the stream through the *Oost Gat,* and the united streams proceed about N.N.W. to the sea. In the same manner the flood-tide divides itself at this spot, running partly into the *Roompot* and partly into the *Oost Gat;* and this collision, both on the flood and the ebb, produces those eddies which have formed the irregular ground of the Querens or Kueerens.

REMARKS *on the* TIDES *in the* EAST SCHELD, *and* BROUWERSHAVEN GAT, *and also without the Entrances, by Captain* S. J. KEUCHENIUS, *of the Dutch Royal Navy.*

The common rise of the water on the quarter-days, at Zierikzee, is 9 feet 2 inches, and at Brouwershaven 8 feet. Spring tides at the former place rise 10½ feet, and at the latter 10 feet; but the strength and direction of the wind will make a great difference.

Although there are many causes that affect the rise and fall of the tides; yet the observations made during the summers of 1825 and 1826, with great accuracy, every half hour, have given the following results of the mean rise every half hour at both these places:—

At *Zierikzee*, in the first hour of flood, only 8 inches; second hour, 1 ft. 4 in.; third hour, 1 ft. 8 in.; fourth hour, 2 feet; fifth hour, 2 ft. 4 in.; sixth hour, 1 ft. 4 in.

And the mean fall is, in the 1st hour of ebb, 8 inches; 2nd, 1 ft. 8 in.; 3rd, 2 ft. 4 in.; 4th, 2 ft. 4 in.; 5th, 1 ft. 8 in.; and 6th, 8 inches. At Brouwershaven the rise and fall is a few inches less than at Zierikzee.

Outside *Brouwershaven Gat*, as well as off the *Gats* of the *East Scheld*, the streams of tide have the same rotary motion as those off the gats or channels of the West Scheld, as stated above.

In the *Roompot* the flood and ebb run in and out almost 2 hours longer than in the Veere Gat, on the other side of Onrust, making the latter part of the ebb of the Roompot the first of the flood in the Veere Gat.

Within the point of Noordland bank the first flood takes its direction over Neeltje Jans bank; and in like manner the first ebb draws northerly over the banks, on which account, both in going in and coming out, it is necessary to be guarded against calms.

On the outside of the outer buoy of Brouwershaven Gat, the southern or flood-tide, which runs during 6 hours in an irregular direction between west and south, begins here 2 hours before it is low water at Brouwershaven, and with it the water begins to rise.

The northern or ebb-tide, which runs 6 hours in an irregular direction also, between east and north, begins here 2 hours before it is high water at Brouwershaven, and the water then begins to fall.

With the northerly tide at sea, the stream takes first an easterly direction, and runs in at the gat; at which time, vessels having an adverse wind may begin to work up in the gatway toward Brouwershaven. But as the latter part of the southerly tide sets directly across the Banjaards, vessels should be very cautious not to approach the *North Banjaard* before the northerly tide begins at sea.

Inside the Hoek of Schouwen Island, it is high water almost an hour before it is high water at Brouwershaven; and the stream drawing inward, runs more regularly, taking the direction of the channel, both with flood and ebb.

In the Kous channel (inside the Hoek of Schouwen), the tide turns two hours before it is high water at Brouwershaven, and runs in a N.E. and northerly direction, over the northernmost ridge of the *Ooster Bank*.

In the *Springers Diep*, from the point of the Springer inward, the flood and ebb run regularly in and out, between the shore and the banks; and the same takes place in the other channels, above the Ossenhoek.

On the TIDES *in and before the* GAT *of* GOEREE, *and the* BRIELLE CHANNEL, *by Captain* RYK.

In all the channels, the flood in common tides runs a little more than 4 hours, while the ebb runs full 8 hours. With the flood, the water continues to rise only 3, and with the ebb, to fall about 7, hours; so that, during the last hour of both ebb and flood, the current runs with but little apparent variation in the depth of water.

About *Goeree Island*, with a quarter moon, the tide usually rises about 5 feet 7 inches, but on the *Brielle Bar*, not more than 4 feet 11 inches; and upon an average it does not rise during the first hour and half of the flood, above one-fourth of its whole height, attaining its highest point in the next two hours, and remaining nearly at that level until the ebb makes. During the first two hours of the ebb, it does not fall more than at the rate of about 10 inches in each half hour; after which it falls about 1 foot in the same space of time, till toward the last of the ebb, when the fall is again 10 inches per half hour.

Sometimes, however, owing to the prevailing winds, the tides rise and fall with less regularity, particularly off Goeree; and the same cause also influences their direction and velocity. With northerly and westerly winds the flood runs longer, and rises higher; while southerly and easterly winds equally affect the ebb.

Along the coast, the *flood* sets from the west end of *Goeree Island*, and follows in part the direction of the outer edge of the *Hinder*, or about E.N.E., till it comes opposite *Brielle Bar*, when it runs N.E., following the bend of the *Hoek of Holland*.

In the channels the flood runs as follows:—following the line of the *Ooster Bank*, it enters the Gat, and continues in an easterly direction, to where Goeree church appears in a line with Oosternolle; it then runs more south-easterly, to where that church bears in a line with the third jetty head, counting from the easternmost, whence it takes a direct S.S.E. course.

From the entrance of the *Noorder Gat*, (or *Quax-Deep*,) to where Goeree church appears in a line with the *Kroonboom*, the flood runs S.E. by E., and there dividing, part runs S.E., crossing the Hinder over the Ribben, and sets gently toward the Kwade Hoek, till, at the Tonne Plaat, having united with the flood running up the West Gat, it then strongly sets upon the Kwade, as well as upon the shore to the eastward of Goeree canal, as far as Stellendam. The other part, running between the banks, follows the bend of the north side of the Pampus, S.E. by S., till off Hellevoet, where it turns 2 points more easterly.

Upon the flats of the Maas *(the entrance by Brielle)*, the early flood sets in upon the north-east side of the *Zeehonden Plaat*, and thence toward the Kwaks Diep (an old channel now filled up). After running about an hour in this direction, it changes suddenly, and runs N.E., to where the *Stone Beacon* of the Brielle appears in a line with *Zeeburg;* here the stream begins to run more easterly, following the line of the coast, till it separates into the Zuid Bank channel, and the old channel of the Noord Bank.

Off *Goeree Island*, the first of the flood sets off shore; but outside the *Maas Bank* it sets on the shore, except with southerly winds, when it generally sets off, so that with a strong breeze from that quarter, the buoys upon the shoals of the Maas scarcely change their north-easterly drift or swing.

SECTION XI.

HOLLAND *and* GERMANY, *from the* TEXEL *to the* EYDER, *and thence to the* SKAW POINT.

The range of Islands, to the E.N.E. of the Texel, are low in general; but, in clear weather, may be seen from 12 fathoms of water.

Ships from the westward, and bound to the Ems, the Weser, or the Elbe, in general, pass the Texel at the distance of 16 or 17 miles; where there is from 15 to 17 fathoms of water, with sandy ground.

The courses by compass, from the longitude of 4° 30′ E., and latitude 53° 22′, to the outer buoy of the Western Ems, are E. ¼ S. 14 leagues, and E.S.E. 9 leagues. From the same point to Heilgoland, the magnetic bearing and distance are E. ¼ N. 41 leagues. With these courses, a proper allowance must be made for wind and tide, particularly the stream of flood, which sets generally to the E.N.E.

By steering, with an open-wind, from W.S.W., West, or W.N.W., toward Heilgoland, you will get into from 20 to 22 fathoms of water, with blueish clay ground, in the part called Heilgoland-deep. To the northward of these soundings are 25 and 26 fathoms, decreasing as on the Chart; and, to the southward, only 15 and 14 fathoms, with white sandy ground.

Vessels should not venture nearer to the coast, than in 12 fathoms; with a southerly wind they may safely stand in to 13 fathoms.

ISLANDS *and* CHANNELS *between the* TEXEL *and the* EMS.

All the shores between the Texel and the Elbe present a scene of inundated or alluvial lands; and the encroachments of the sea, within the last half century, seem to threaten a total destruction of the isles, within a period not very remote, if not prevented by art and industry. The first island northward of the Texel, and its appendage *Eierland*, is the *Vlie Land*, now reduced to one half of its antient size; the southern half, under the name of *De Hors*, being absorbed in the sea. On the northern part, however, is a village, several beacons and a lighthouse, which serve to distinguish the *Vlie Stroom*, or northern channel of the *Zuyder Zee.* The present lighthouse was erected in 1836, and shows a brilliant fixed light, that may be seen, in clear weather, nearly four leagues off.

From the N.E. side of Vlie Land the S.W. end of the next island, *Terschelling* or *Schelling* bears W.N.W. 5¼ miles. The banks between form the several passages into the Vlie Stroom called the *Stortemelk*, the *Holleport*, the *Nieuwe* or *New Gat*, and the *Oost* or *East Gat.*

TERSCHELLING extends nearly East and West, nine miles. The village named *West Schelling*, stands near its S.W. point, from which point a bank extends outward to the distance of about two miles. Near the village is a conspicuous tower, (*Brandaris,*) with two beacons and two light-towers. There are three other villages on the isle, *Midsland*, *Hoorn*, and *Oosterend*, as shown in the charts.

The Western Gat of the Vlie Stroom is the STORTEMELK, near the Vlie Land, but it is narrow, and intricate. Its entrance is marked by a buoy painted *red and black*, and several other buoys, within the Bar, distinguish the channels leading to the main stream. From the outer buoy the lighthouse on Vlie Land bears about S. by E. 2½ miles.

The HOLLEPORT is the principal and best channel into the Vlie Stroom. Its entrance lies in latitude 53° 22′ 30″, and 2½ miles northward of the Stortemelk, between a bank on the north called the *Noorder Buitengrond*, and another on the south, called the *Wester Grond.* On the N.W. side of the latter is the *Goud ton*, a white buoy.

The outer buoy of the Helleport is *red*, and lies with a beacon on the strand of Vlieland S. ¼ W. in one with a mill on the South side of the Island, and the S.W. extremity of Terschelling S.E. by E. A black buoy marks the north side of the channel, at a mile within the outer buoy, and a white buoy lies on the south side, at a mile and a half from the black buoy. This buoy, called the *Ton van Engelsch Hoek*, lies on the western side of the Vlie Stroom. At the entrance of the Holleport the depth is 5 fathoms; it diminishes eastward to 4 and 3½; and, falling into the Stroom, to 8½ fathoms.

The NEW GAT.—The entrance of the *New* [*Nieuwe*] *Gat*, leading to the Vlie Stroom, lies in latitude 53° 25′, at 5½ miles nearly N.E. from the Holleport, and is a convenient passage for vessels from the northward. It is nearly half a mile wide, between the *Noorder Buitengrond* on the N.W., and a bank, called the *Noord Vaarder*, on the S.E. The course in is nearly W.S.W. ½ W. The outer buoy is *black*, and there are three other black buoys within, to be left on the larboard side. These are marked *Alexander's ton*, *Heertjes*, and *Binnen Noordsv.* The bearing from Alexander's ton to the Heertjes is W. by S. one mile; and from the latter to the Binnen Noords Vaarder, S. ¼ W. nearly the same. Opposite to the last mentioned buoy is the English Hook buoy, above-mentioned; and above this, on the same or western side, are two other white buoys, which mark the entrance of the Vlie Stroom. On the Bar, at the mouth of the New Gat, the depth is 3½, increasing in the mid-channel, off *Alexander's* ton to 4½, and further on to 5 fathoms off the elbow of the bank on which the *Heertjes* ton is placed; farther in, on a South course, are 8 and 9 fathoms; and off the last white buoy on the starboard hand are 10 and 12 fathoms, in the middle of the stream. Here the channel widens to the breadth of three-quarters of a mile, and the course up to the Vlie Road, which is on the western side, is S. by W., 4 miles, with depths of 7, 10, 11, 7, to 5, fathoms in the Road, which is two miles above the eastern point of Vlieland. From this part of the Stroom coasters and small vessels take the different channels to Harlingen, &c.[*]

The OOST OR EAST GAT of Terschelling lies along the Shore and Bank of that island. It is too narrow and intricate to be used by any other than small vessels, and those well acquainted with the banks.

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[*] According to the late excellent Surveys of the Coasts of Holland, the longitude of the western tower gate of *Amsterdam* is 4° 53′ 10″ E. from Greenwich. The western kerk or church of *Harlingen* is in latitude 53° 10′ 29″, longitude from Amsterdam, 0° 31′ 43″ E.; from Greenwich, 5° 24′ 53″. The village tower of *Schiermonnik-oog*, latitude 53° 28′ 47½″, long. from Amsterdam 1° 16′ 38″, from Greenwich, 6° 9′ 48″. The light-tower of *Borkum*, latitude 53° 35′ 20″, longitude from Amsterdam 1° 47′ 15″, from Greenwich, 6° 40′ 25″ E.

See the Chart of the Coasts of Holland and Germany, from the Texel to the Eyder, published by Mr. Laurie.

AMELANDER GAT.—From the east end of Terschelling a dry bank, which seems formerly to have constituted a part of that island, extends more than five miles in the same direction, and forms the western side of the *Amelander Gat*, which lies between it and the island Ameland. This gat has three entrances, called the *Noordwest-Gat*, the *Akke-Polle Gat*, and the *Noord-oost Gat*. Beyond these, to the eastward, the Island extends 11½ miles to the E.S.E., and presents to the eye, amidst broken and sunken land, several small villages, of which *Hollum*, toward the western end, is the chief.

The N.W. Gat, latitude 53° 27′ 45″, is formed on the south by the sunken land of Terschelling, named the *Bosch*. It is very narrow, and the depth on the Bar, at low water, is little more than 12 feet, but the depths within increase to 4 and 5½ fathoms. The outer buoy, at a considerable distance without the Bar, is *red*, and lies in 5 fathoms, with a beacon on the west end of Ameland, in a line with the church of Hollum. At two miles S.E. ¾ E. from the outer buoy, is the first black buoy on the starboard side of the channel, lying with nearly the same marks. Two other black buoys lie farther up on the same side; the first of these at the distance of a mile, and the next at the farther distance of a mile and a half; while the channel continues a mile more to the E.S.E. into the main stream within Ameland.

The *Akke Polle Gat*, which lies nearly parallel with the N.W. Gat, at the distance of a mile, appears to have sufficient water, but it is not buoyed. Its entrance lies with Hollum church in one with the western down or hummock of Ameland, bearing S.E. ½ S.

Noord-oost or N.E. Gat. The *Born Rif* or *Reef*, which lies off the main channel of Ameland, separates the Noord-oost Gat from the Akke Polle Gat. It extends 4 miles to the E.S.E. The entrance of the N.E. Gat is a mile wide, between this bank and the low water mark of Ameland. The Bar, which is two miles broad, has from 12 to 15 feet over it at low water. The leading mark over it is, two beacons on the eastern point of the Bosch in one, bearing S. by W. ½ W., which lead over it in the best water. The channel within the bank, extending from the south side of Ameland, is more than half a mile wide, and its depths are 10 and 12, decreasing inward to 7 and 5, fathoms.

At the eastern extremity of Ameland is a narrow passage called the *Pinke Gat*, the entrance of which is nearly dry at low water, and can be passed with the tide by small vessels only.

The **VRIESCHE GAT** or GRONINGEN CHANNEL, the most important channel of this coast westward of the Ems, has its entrance in latitude 53° 32′, longitude 6° 5′ E. A *red buoy*, as a fairway buoy, lies without the Bar, in about 5 fathoms, and the channel way thence is buoyed with white buoys on the eastern and black buoys on the western side. The outer buoys, on the Bar, lie at two thirds of a mile within the buoy of the fairway, which lies with the village tower of *Schiermonnik-oog* bearing S. ¾ E. nearly 4½ miles.

The first three white buoys lie nearly in a line, S.W. by S., at three quarters of a mile apart. The first three *black buoys*, on the opposite side, are likewise nearly in the same direction; but the second is a mile and a half from the first, and the third a mile from the second, or three-quarters of a mile from the third white buoy. The bar is a mile and a half broad, and the depths over it are generally about two fathoms at low water.

Nearly in the direction of the first three white buoys, on the edge of the eastern bank, is the fourth white buoy, at the distance of two miles from the third. Here the channel is more than half a mile broad, and has a depth of 6 fathoms. It now takes a turn more to the eastward, and at a mile higher is the fifth white buoy, on the eastern, and the fourth black buoy on the western, side, with an increasing depth in the channel, thence lying in the direction of S.E. to the entrance of the passage called the *Slenk*, leading toward Groningen, a distance of 4 miles. Two other white buoys mark its eastern, and three black ones its western, side; and off the last, in mid-channel, is a depth of 9 fathoms.

DIRECTIONS *for the* EMS, *to* DELFZYL *and* EMDEN.

The extensive Estuary of the Ems has three distinct mouths or entrances, known as the *Western Ems*, the *Eastern Ems*, and the *Homme Gat*; but of these the Western Ems is the chief. The last lies between the remains of the Isle Rottum on the West, and those of Borkum on the east; and the entrance is between two banks, called the *Geldzak Plaat* on the north, and the *Huibert Plaat* on the south. Its outer buoy is *black*, and it lies in latitude 55° 36′ 30″, at 13½ miles E. ½ S. from the red buoy at the mouth of the Vriesche Gat, which has been described.

Upon the Isle Rottum are two wooden beacons and one house. Upon Borkum are also two beacons and a light-house. The light is composed of 27 lamps, at 150 feet above the surface of the sea. Nine of the lamps are turned toward the land, and the other 18 toward the sea. The light may be seen more than six leagues off.

The outer buoy of the Western Ems (black) lies with the two beacons on Rottum in one, bearing S. ¼ E., and the southern beacon on Borkum in one with the light-tower, S.E. by E., and from this a white buoy on the S.E. end of the Geldzak Plaat bears E.S.E., one mile and a quarter. A black buoy, called the *Dremple*, lies nearly south, half a mile, from the Geldzak buoy, and the passage in is between these buoys, keeping over to the north side, where there is 3 and 3½ fathoms at low water.

Having passed the Geldzak buoy to the distance of a mile and a half E.S.E. you will have gained the middle of the main stream, and a depth of 10 fathoms. The channel hence is distinctly buoyed with white buoys on the eastern, and black buoys on the western, side; and you proceed S.S.W. and S.W. by S. 5 miles, until the Binnen or Inner Huibert Buoy bears S.W. and the light-tower on Borkum N.E. by N. Hereabout the channel is a mile wide, and the ground of blue clay, with shells and stones.

At nearly two miles S.E. by S. from the inner Huibert Buoy lies the N.W. end of a middle ground, called the *Meeuwen Staart*, which thence extends 4½ miles S.E. by S. It has a white buoy near each end, with one near the middle, and the common passage up the river is on its western side. Four black buoys mark the opposite side, exclusive of another, marked *Bolbaken*, at the entrance. The courses up are S. by E. and S.S.E. to S.E. 8 miles; depths 14, 10, 8, 9, 8, and 14, fathoms.

Be careful not to get to the eastward of the first buoy of the Meeuwen Staart, as the tide of flood sets strongly upon that sand. Go no farther to the eastward than with the light-house on Borkum N. by E.; but if the weather be thick or hazy, so that it cannot be seen, you may keep the west side on board, by the lead, or in 6 or 7 fathoms of water.

The Eems Horn, another middle ground, lies at the distance of three miles to the S.E. from the S.E. end of the Meeuwen Staart, and the north side of the channel here is bounded by the extensive flat called the *Randsel*, which separates the Eastern from the Western Ems. Three black buoys on the edge of the Eems Horn, on proceeding upward, are to be left on the west or starboard hand. The Eems-Horn is 4 miles long, though narrow, and having a gat on its western side, into which the flood sets strongly, and which must, therefore, be cautiously avoided.

In proceeding upward, from the S.E. end of the Meeuwen Staart you steer E.S.E. three miles, to a berth off the north end of the Eemshorn: the course thence will be S. by E. and South, to the inner buoy (black) on the S.E. edge of that sand, whence a S. by W. and south course leads to the Road of Delfzyl, to which you may be guided by a white buoy, that of the *Hond*, which is to be left on the larboard side; taking care to avoid the Gat at the back, or on the East, of that sand.

The Eemshorn, being steep-to, must be cautiously avoided; there are 8 and 9 fathoms close to the eastern side of it. Approach no nearer than in 5 fathoms. In this part the streams of the Eastern and Western Eems unite, and render the navigation dangerous; so that, were a vessel to ground here, she would probably be wrecked.

Having passed the Eemshorn, you then proceed between the western shore and the middle grounds called *De Hond* and *Paap*, which occupy an extent of six miles to the S.S.E., and are steep-to. The depths are 9 to 6 fathoms at low water, and you should not advance, on the western side, into less than 5. When a windmill to the southward of Delfzyl comes open, steer with it on the bearing of S. ¾ W. as seen over the town, and it will lead clear of the western edge of the Paap; then keep the lead upon the Groningen shore in 5 fathoms, until you open the haven of Delfzyl, whence you may keep over toward the Eastern shore, in 6, 7, or 5, fathoms. In the mid-channel there are 8, 9, and 10, fathoms, with soft sticking ground. Now keep over E.S.E., leaving a white buoy on the Paap on the larboard side, to the point on the East Friesland side, called the *Hoek van de Knok*, from which a breakwater projects out, with a swinging beacon, altogether about three cables from shore.

At half a mile S. by E. from the Hook, a black buoy marks the extremity of the *Wiebelsummer Plaat*, which, on proceeding for the Road before Emden, is to be left on the starboard side. By steering hence along the East Friesland side, with the tide, you will reach the road, whence any vessel may, at *high water*, sail up to the city, where vessels, drawing 12 feet, may conveniently lie along near the houses, &c.

The **EASTERN EMS.**—The eastern Ems is separated from the Western Ems by the extensive bank, called the *Borkumer Rif*, from its extending to the N.W. from the Isle of Borkum. The mouth of the Eastern Ems is to the eastward of the Reef, and its outer buoy, which is black, lies in latitude 53° 40′ 45″, with the high beacon in Borkum in one with the light-tower, bearing S. by E., 6 miles distant.

The channel eastward of the outer buoy is regularly denoted by white buoys on the eastern, and black on the western, side. The first white buoy bears from the outer buoy E. by S. rather more than two miles. It lies in 5 fathoms, and the ground westward of it is soft and sticky.

The second black buoy lies in 5½ fathoms at a mile and two-thirds S.E. by E. from the outer buoy, and a mile W.S.W. from the first white buoy. Depth in the channel between, 6½ fathoms. From the second black buoy, the third or *Middel* bears S.E. by E., one mile and a half; and the fourth from the third S.E., at rather more than that distance. The second or middle *white buoy* lies on the opposite side, a little below the fourth black buoy, in 5½ fathoms. The general direction of the channel, between these buoys is S.E. and the flood sets in its direction, the depths in which are 6 and 7 fathoms.

From the second white buoy [*Middel witte ton*] to the Binnen or Inner white buoy, on the tail of the bank called the *Juister Rif*, the bearing and distance are S.E. ½ S. 2¼ miles. Opposite to this white buoy, bearing W. by N. one mile, is the 5th black buoy, or *Middel Brouwer ton*, in 4 fathoms. Passing these buoys, you enter into the main stream of the Ems, marked on the south by the *Binnen Brouwer* or 6th black buoy, and will have crossed a Bar of 3½ fathoms, and the line of direction in which two beacons on the easternmost extremity of Borkum appear in one.

From the black buoy last mentioned the direction of the Ems is S.E. ½ S. and its breadth for four miles upward is more than a mile; depths from 8 to 11 fathoms: it is thence contracted by a bank on the western side, named the *Konings Plaat*, to less than half that breadth. Three black buoys, on that side, mark the edge of the shoals, which are steep-to. Of these the last, or *Konings ton*, appears in the middle of the river, at 5 miles above the *Binnen Brouwer ton*, or buoy. Near the Konings ton is a roadstead for large ships, having a depth of 10 fathoms.

From the Koning or King's Buoy the next buoy is the *Kaap-ton*, which is *red*; the distance between is two miles, and the course up S. by E. and South. Depths 10 to 6 fathoms. You now arrive at the *Wester Balg*, or narrowest part of the channel, where there is shoaler water.

The Wester Balg is buoyed with three white buoys on the eastern, and two black ones on the western, side. The last is called the *Randzel Buoy*. The depths in the channel, which is less than half a mile broad, are from 6½ to 3 fathoms, and the leading mark to the Randzel buoy is the high spire-steeple of *Holwierda*, upon the Groningen shore by the right side of a small wood, called the *Wood of Watum*, and bearing S.S.W. ½ W.* With the steeple just touching the Wood on the west, you may pass through the Wester Balg to the Randzel buoy; but this mark continued will lead over the Bar at the termination of the Balg, whereon are only 6 and 7 feet at low water: you will, therefore, make for the fairway buoy of the *Balg*, which may be passed on either side in 12 or 14 feet, and thence proceed by the Eemshorn, as already directed.

Allowance must, in all cases, be made for the tide. Below the Koning buoy the flood sets strongly upon the Randzel and the ebb on Brouwers Plaat, and the Juister Rif.

The **HOMME GAT**, eastward of the Eastern Ems, is a passage into the same, divided only by the *Juister Rif*. A sand, called the *Schaape*, forms its eastern side, and a

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* This is a good mark in winter, when the buoys are taken up.

red buoy, on the north side of that sand, lies at some distance eastward from the entrance, with the two beacons on the east end of Borkum in one.

Vessels bound to the Gat from the westward, should keep the lead, whilst to the northward of Juist Rif, in 8, 7, and 6, fathoms, according to the wind, &c. till they bring the light-tower on Borkum S.W. by S. or on the west side of a round rugged down, called *Kat duin*, which is remarkable and readily known. On entering the Gat you will pass the spit of the Schaape, leaving it to the northward, and will approach a white buoy on the western side of that sand, which is to be left on the larboard side. The depth at the mouth of the Gat is 4 fathoms.

At two miles S.S.W. from the white buoy, above-mentioned, is a black beacon buoy in about 5½ fathoms, on the edge of the *Juist Rif;* and, at rather more than a mile S. by W. from the latter is the *Binnen* white buoy, on the extremity of the same bank, which has been mentioned in the description of the Eastern Ems. Here you will have entered into the main channel, and may proceed S.E. ½ S. to the Konings ton or King's buoy, which is to be left, as already shown, on the starboard side.

DIRECTIONS *for* HEILIGOLAND *or* HELIGOLAND.

HEILIGOLAND, commonly pronounced Helgoland, and, more properly, Holigiland, or Holy Island, is a flat island of good height, inhabited chiefly by fishermen and pilots. It may be seen, in clear weather, from the distance of 6 or 7 leagues. Upon it is a modern lighthouse, now under the direction of the Trinity House, London, which is 250 feet high from the level of the sea, and lighted throughout the year. The latitude of the lighthouse is 54° 11′ 20″; longitude 7° 53′ East.

This island bears from May Island, off the Frith of Forth, S.E. 378 miles; from Tinmouth, S.E. by E. 327 miles; from Flamborough Head, E.S.E. 277 miles; from the Spurn Point, E.S.E. ½ E. 272 miles; and, from Yarmouth, East, 238 miles.

To the S.E. of the island lies the *Klip*, or Steen, *(Stone,)* a rock represented in the Chart, having a buoy upon it; and, to the eastward, is the *Sandy Isle*, or Sand Downs. The latter consist of some small sand-hills. Between these downs and the island vessels may ride, in case of distress, or if they are prevented from entering the rivers by ice, &c. To the eastward of the Sandy Isle, vessels may also ride with West and W.S.W. winds, in from 5 to 10 fathoms.

Both Heiligoland and the Sandy Isle are surrounded by dangerous rocky shelves, which stretch off as represented in the Charts.

In sailing from off the Texel toward Heiligoland, keep in 15, 16, or 17, fathoms, until you have passed Borkum Reef. The reef may be known by the soundings off it, which are coarse sand, with small red stones, and shells of a dark red, or yellowish, colour. There will be found here about one fathom and a half less water than on either side. The soundings extend about 9 or 10 leagues toward the North and N.N.E., at the mean distance of 19 leagues from Heiligoland. They are very remarkable, there being no other such on any other part of the coast; hence every one ought to obtain them, in order to ascertain their distance from Heiligoland, when sailing for the Elbe.

In hazy weather, or with northerly winds, vessels may keep farther from shore than above mentioned; and if, in this case, it be supposed that the vessel is within 7 or 8 leagues of the island, when in 17 or 18 fathoms, with soft muddy ground, it is recommended not to steer for it, as the reckoning may be deceptive; and it is likewise to be observed that, at 6 or 7 leagues to the northward of the island, there are soundings nearly similar to those off the shore to the southward, and also soft ground in the parallel of it. It is therefore particularly requisite that navigators should be certain of having the soundings from the coast, or a good observation from the island. For it is known that the commanders of several vessels, neglecting this precaution, have supposed themselves to be off the coast, in 18 or 19 fathoms; and, having steered to the S.S.E., have gained 14 or 15 fathoms, with coarse sand and small stones; but, with these soundings, have found themselves several leagues to the northward of the island.

At the south end of Heiligoland is a sharp rock, called the Monk, represented in the East view of the island; and, to the south-eastward of this, the Klip, or Steen, before mentioned.

The marks for the latter are, a small wooden beacon on the south end of the island and the old lighthouse in one, with two wooden beacons on the Sandy-isle in a line. As the buoy is, in stormy weather, sometimes driven away, the marks are the surest. The length of the Steen is about 14 fathoms; the depth over it 12 feet.

The leading-mark from the northward for Heiligoland Road is, a beacon on the shelf, just open of the cliff, bearing nearly S. by E. Keep the mark on until half a mile from the north end of the island. Then steer for the anchorage in the North Haven, allowing for the tide.*

Although, in general, anchoring at Heiligoland is not to be recommended, because there is, in neither of the harbours, called the *North* and *South Havens*, much security, and the ground is rocky, yet circumstances may compel you to take it; and, in this case, the following directions ought to be observed.

For entering the harbour from the southward, the best passage is between the Steen and the island; keeping the southernmost beacon on Sandy Isle open to the eastward of the northernmost till the beacon on Heiligoland comes open to the westward of the old lighthouse. You will then be within the Steen, and may proceed to the anchorage, observing to keep well over toward Sandy Isle, where you have the deepest water.

When advancing from the eastward, keep the beacon on Heiligoland open to the westward from the old lighthouse; and, when the southernmost beacon on Sandy Isle comes open to the eastward of the northernmost, you will be within the Steen, and may proceed to the anchorage.

The marks for the anchorage are,—the flag-staff on the south point of the island in one with the old lighthouse, and both the beacons on the Downs in one; or the large beacon a little open to the southward of the small one, where there is good holding-ground and 4 fathoms of water.

Intending to come in by the North passage, bring Heiligoland to bear S.E. by compass, and proceed in that direction, until you have approached the island to a mile distance from you, but be careful not to lose sight of the new lighthouse lantern; or observe to perceive always the top of the old lighthouse over the cliff. In night-time keep sight of the light just above the cliff. When the north point of Heiligoland bears South, or the beacon in the lower town is open of the cliff, you may run in. In night-time keep the light always visible above the cliff; when it bears S. by E. ½ E. you may bear up for the anchorage, taking care always to keep the light from being shaded by the cliff. Keep your lead constantly going, and come not nearer to the Sandy Isle, or Downs, than in 4 fathoms; in the middle of the channel are 6 to 7 fathoms of water. The best anchoring for large vessels is eastward from the Downs or Sandy Isle.

DIRECTIONS *for the* RIVER WESER.

The first island to the westward of the Weser is that called *Wangeroog*. It is so low as to be partly overflown by the tide, and has a sandy shore. Upon it is the tower of a church; and a lighthouse, which was first lighted on the 1st of November, 1830. It is built of bricks, in form of a column, and supports a lantern, in which, at 67 Hamburg feet above common high water mark, an *intermitting light* is exhibited, which is alternately visible and invisible for the space of one minute, and is thus distinguished from the neighbouring lights at Borkum, Heiligoland, Neuwerk, and Cuxhaven, all of which are fixed lights.

On board ship, supposing the eye to be 9 feet above the level of the sea, this light is seen at the distance of twelve miles, and consequently becomes visible westward before the East-Friesland island of Langer-oog; northward, midway between Heiligoland and Wanger-oog; eastward, near the light-vessel before the Weser, where the light of Neuwerk likewise begins to appear; and southward on the whole of the Flats below Wanger-oog.

From the high tower with three pinnacles, which is situated on the western part of the island of Wanger-oog, and discernible as a day signal, at a considerable distance at sea, the new lighthouse stands E. ¼ N. or N. 88° E. by compass, distance 1750 feet.

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* In July, 1819, notice was given, to those frequenting the Elbe, that the patent chain-moorings, which were laid down in July, 1816, for the occasional use of merchant-vessels, had been taken up, and sent to England; so that vessels puttting in here must in future rely on their own means of safety, if they come-to in this dangerous anchorage.

Vessels from the westward, in a fair wind, may keep in 11 or 12 fathoms along the shore, until Wangeroog-tower comes in sight. By keeping in the same depth, they will arrive at the first black buoy, called the *Schlussel Tonne*, or *Key Buoy*, which is to be left on the starboard side, as are all the other black buoys, and the white buoys on the larboard. Be sure to take your soundings from the shore, in order to avoid the *Nord Plaat*, or the bank which forms the two entrances to the Weser.

In the entrance of the Weser, rather before it, the ground is soft; a sure indication that you are there.

Notice was given, dated 15th November, 1818, that a floating light had been established between the two sands called the Teglers Plaat and the Mellum, in the fairway, near the seventh black buoy, called the Mellum Buoy. The vessel is moored to a chain below the buoy, in 8 fathoms of water at the making of the flood-tide; and is, on no account, to quit its station, unless forced by ice.

The following marks distinguish it:—It has two masts, a large or main-mast, and a small one. During the day-time, a white flag, with a red cross on it, is kept flying from the top of the main-mast; and, during the night, it is replaced by a lantern-light, 28 feet higher than the deck. This light is visible, in clear weather, at the distance of more than 3 miles.

The bearings from the light are, Heiligoland, by compass, N. ¼ W.; the Tower of Wangeroog, W. ¾ N.; the Church of Minsen, S.W. by W.; and the Bremer Beacon, S. by E.

If bound from Heiligoland to the Weser with a northerly wind, steer to the southward until Wangeroog comes in sight. Then bring the island to bear S.W., but no farther West, before you enter the river.

Should it happen, when between Heiligoland and Wangeroog, that the weather becomes thick and hazy, so that land cannot be seen, steer no nearer to the coast than in 13 fathoms, clayey ground. Here, with a flood-tide and fair weather, you may anchor; but, with the ebb, keep under sail. Here the flood will drive to the southward, and the ebb to the contrary.

The different black buoys which mark out the channel are distinguished by letters marked with white paint; and the white buoys numbered, in like manner, with black paint. Vessels may run to either of them, to see the marks and numbers.

The *Schlussel Buoy*, which is the first black buoy of the Weser, lies with the lighthouse of Wangeroog bearing nearly S.W., distant 5 miles. A series of black buoys extends hence, along the edge of the sands, to the coast of Oldenburg, regularly marked, as above mentioned, with letters from A. to W, as represented on the Charts, exclusive of which there is also a beacon between the buoys M and N, called the *Bremer Beacon*.

The first white buoy, No. 1, lies one mile and a quarter to the N.N.E. of the Birn Buoy, or black buoy marked A, and a fair-way course from between these buoys to the second white buoy will be S.E. ¼ S. 5¼ miles; thence to the third white buoy, S. by E. ½ E. 4½ miles; thence to the black buoy marked I, called *Schmidts Steerts Buoy*, South, 2¼ miles; and thence to the *Kreuz Buoy*, white, No. 7, S. by E. ¾ E. 7 miles: whence you may proceed to Blexen, as the Chart directs, where you may have a pilot for Bremen.

Proper allowance must be made for the tide; and observe, particularly, that the flood sets strongly to the southward into the Jahde, from the first to the fourth black buoys; and the ebb, on the contrary, to the northward.

The FOLLOWING DIRECTIONS for the WESER are from those published by authority at Hamburg, in 1826, 7.

Vessels at Heiligoland may there engage a pilot for the Weser. But, having no pilot, you must steer from Heiligoland S. by W. till you have in sight the tower of the church of Wangeroog. Then bring the tower to bear S.W., and steering in this course toward it, you will, in 5 to 7 fathoms, get over the tail of the Nord Plate, and come in the fair-way of the mouth of the Weser, where you will see the white buoy, No. 1, and from this go on in your course between the buoys, the white to the larboard, and the black to the starboard, to the floating-light, Bremer beacon, &c., whereabout, if not sooner, you will meet a pilot-boat.

In case of steering south from Heiligoland, and holding that course exactly, you may, perhaps, gain sight of the signal-vessel of the Weser sooner, or at least at the same time, than the tower of Wangeroog; and, in this case, wind and weather being favorable, steer in the same course, bearing upon the signal-vessel into the north mouth of the Weser. But this entrance is to be recommended only for vessels drawing no more than 8 to 10 feet, and there being no buoys, you must the more constantly, when eastward of the Nord Plate, let go the lead.

By far the greatest part of the ships bound to the Weser, come from the westward, steering along the islands Baltrum, Langeroog, Spiekeroog, to the height of Wangeroog, in the depth of 11 to 12 fathoms. Here, when you see the high tower of Wangeroog, steer somewhat more to the eastward, or approach to the shore until you have 10 or 9 fathoms of water, then bring the tower to bear S.W., and steer N.E. to the Schlussel-ton; here you will find, in the depth of 10½ or 12 fathoms, it being low or high water, the black buoy, called the *Schlussel-ton*, which is the outer buoy, and to be known by a gilt key on it.

The following *black buoys* are marked with white letters, A, B, C, &c. The outer *white buoy*, No. 1, bears from Wangeroog half a point more easterly than the Schlussel-ton, viz. N.E. ½ E. In case it be day, and fine weather, so that the buoys are visible, you may approach them always so near, as clearly to discern the large letters and numbers. But, in the night, it will be impossible to find the entrance of the Weser without the light at Wangeroog; which, now restored in a suitable manner, may be distinguished from the lights at Heiligoland and Neuwerk, on the Elbe. You may, however, by your azimuth-compass and lead, advance near enough to the Schlussel-ton, or the white buoy No. 1, to anchor there, behind the Nord Plaat, sheltered against a north or north-east wind, till day-break, when you may proceed on your way into the Weser.

In winter, with frost and ice, you must not enter the Weser, unless you have a great probability of reaching one of the harbours, *Fedderwarden* or *Lehe*, to bring up there the vessel in safety against the ice. In this case you must well observe, that, if there are already drifts of the ice, it is perhaps possible, with westerly winds, to reach Fedderwarden, but by no means Lehe, or the Geestehaven; on the contrary, with north-east or easterly winds, you have more probability to get into the Geestehaven, than into the harbour of Fedwarden. If time and circumstances do not allow you to sail into the Weser, you must take refuge at Cuxhaven, or at Heiligoland, as circumstances may admit.

DIRECTIONS *for the* RIVER ELBE.

The entrance of the River Elbe lies between the *Vogel Sand* on the north, and the *Schaarhorn* on the south, side; and it is buoyed regularly all the way up, as exhibited on the Chart, with white buoys on the N.E. side, and black buoys on the S.W. side, of the channel, which may be seen from each other. There are, beside these, a variety of other distinguishing marks, to be seen at a greater distance.

Large merchant-vessels, from distant parts, being bound to the river, but unacquainted with this part of the North-Sea coast, may do well by sailing first to Heiligoland, and taking a pilot there for the Elbe. The island is easily to be found by its latitude 54° 11′, and by being elevated about 200 feet above the water, consequently may be seen at the distance of 5 leagues, in clear weather, by day; and by night a good light being always kept on it, may be perceived at the same, or at a still greater, distance.

In stormy weather, with west and north-westerly winds, it is difficult to get a pilot at Heiligoland, on account of the heavy sea and breakers. In this case you must proceed to the back of the Downs, or Sandy Isle, bringing the lighthouse to bear West, and anchor there in about 9 fathoms of water, where a pilot-boat will come to you as soon as the weather permits.

From Heiligoland the red buoy, or first buoy at the entrance of the Elbe, bears S.E. by S., distant 6 leagues. But, by reason of the setting of the tides, you must vary your course for this buoy, steering S.S.E. with the flood and south-westerly winds; and, with an ebb and north-easterly wind, you may steer S.E. In running the fairway for the red buoy, you will have 20, 17, 15, 14, 13, and 12, fathoms, soft clay-ground of bluish colour; and at the red buoy, in 10 fathoms, you will generally find fine yellow sand.

By far the greatest part of ships and vessels, coming from the westward, and being not entirely unacquainted with the Weser and Elbe, or having perhaps found and engaged a fisherman for a pilot, do not sail to Heiligoland, particularly with southerly winds; for, being arrived between Wangeroog and Heiligoland, and having the one or the other of these islands in sight, they steer with an easterly course directly to the Elbe.

When in the middle, between Heiligoland and Wangeroog, which bear from each other N.N.E. and S.S.W., the direct course for the red buoy is E.S.E. distance 5 leagues. To make allowance for wind and tide, you must steer with a flood S.E. by E., with an ebb E. by S., somewhat more southerly or easterly, according to the wind. In so steering you will have 17, 15, 14, 13, and 12, fathoms, and the same soft bluish ground, mentioned before. When standing toward the south shore, and coming into 10 fathoms, or less, the bottom is a hard, white, fine sand. But the sandy shore between the rivers Jahde, Weser, and Elbe, is very dangerous, because it is steep (from 10 to 9 and 7 fathoms, and then dry.) If, therefore, no land nor marks are to be seen, it being night-time, or thick weather, you must be careful not to approach nearer than in 13 fathoms; and then, if a flood, come to an anchor; with an ebb you may perhaps keep under sail till day-time, or till the weather becomes clear.

You must always be careful to regard the tides and winds, and to keep a good lead; remembering that the flood sets the vessel northward and eastward; the ebb, on the contrary, westward and southerly; and, when near the entrance of the Jahde and Weser, in 12 fathoms, the flood sets into the rivers; but the ebb runs always to seaward. These currents are also stronger, the more you draw near the shore, or to the entrance of the rivers Jahde, Weser, and to the deeps and gats between the sands; and in full and change, than in the quarters of the moon.

The times of high-water are shown hereafter. It being a rule, that vessels should run into the Elbe and Weser with the tide, always in the day-time, and never at night, observe to regulate your approaching these rivers accordingly.

MOUTH OF THE ELBE.—The mouth of the river, or rather the entire channel from the entrance of the Elbe to Cuxhaven, being bounded on both sides by sands, southward by *Schaarhorn*, *Neuwerk*, and *Steilsand;* northward by the *Northern-grounds*, *Vogel sand* and its tail, (the *Steert*,) which sands, being overflowed for the greatest part by the tide, are then undistinguishable: it has been necessary to mark out the fair-way by buoys, laid on each side of the channel, the black on the south, the white* on the north side, which disposal may be sufficient to show the fair-way when once entered. These buoys, however, of which the outermost black and white determine the entrance of the channel, (the red buoy being at the offing,) are not to be seen at great distances, in stormy weather, hardly when near, and not at all in the night-time. Moreover, the ton-buoys are taken away in the winter-season, to prevent their being destroyed or driven away by the ice, and spar-buoys, still less visible, put in their places. As to the marks and tokens of the ground, currents, breakers along the edges of sands, they are all too general and misleading; you may, by these tokens, enter as well in the deep at the north side of the Vogelsand, or southerly, in the Westertill as in the true channel of the Elbe. Hence it was that high towers and beacons were formerly built on the island Neuwerk, and in late times improved, by which the entrance of the Elbe may be known both by night and day, provided weather will permit only a clear sight of distant objects.

1. *The marks for the night* are, two lights at Neuwerk, distant from each other nearly one-third of a mile; the highest of which, being the southernmost, is elevated 120 English feet above the surface of the water, and may be seen at the distance of four leagues, supposing the eye at the surface of the sea; but the eye being supposed upon deck about 16 feet above water, you will see the light at 5 leagues distance, or 2½ leagues seaward beyond the red buoy, and still farther, looking out for it from the mast. The lower light being the northernmost, is but half as high, viz. 60 feet above the sea, its visible horizon about 3 leagues, or by the observer elevated 16 feet, 4 leagues, consequently 1½ league beyond

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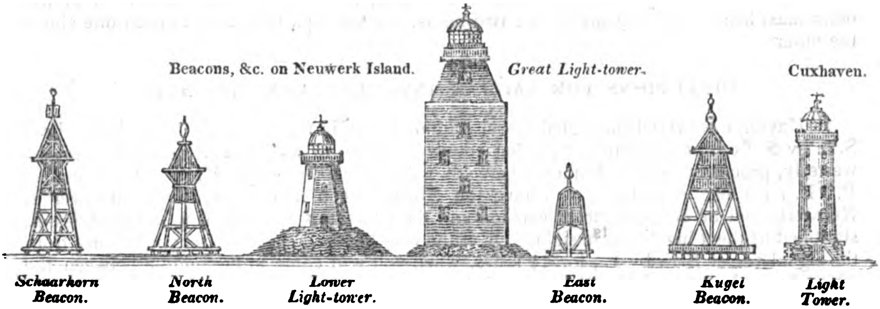
* Besides the colour, which sometimes may cause a mistake, the white buoys are distinguished from the black by their figure and form; the last being conical, with the point under water; but the white, having the shape of a longish cork-buoy with two points, the one above water with a vane, the other under water with an iron bar, holding the chain, which, by its weight, draws down the lever, and by this mean erects the buoy from its natural horizontal situation, and makes it visible at a greater distance. We owe the invention of this lever to Mr. Jansen, commander and inspector of pilots at Cuxhaven.

the red buoy. Thus the light of Heiligoland will not be out of sight before the higher light of Neuwerk appears. Therefore, having discovered the latter, steer so as to make it bear S.E. by S., and proceed till in 13 or 12 fathoms, where you will perceive also the lower light; and then, if circumstances allow, keep under sail, or come to an anchor, till day-time.

MARKS FOR THE CHANNEL OF THE ELBE.


Beacons, &c. on Neuwerk Island.
Great Light-tower.
Cuxhaven.
Schaarhorn Beacon.
North Beacon.
Lower Light-tower.
East Beacon.
Kugel Beacon.
Light Tower.

2. *The marks whereby the entrance of the Elbe is to be found in the day-time* are, the *Schaarhörn-beacon*, which is 3½ miles distant from the red buoy, and bears from the great tower on Neuwerk N.W. by N. 3¾ miles. Next, the great and small towers on Neuwerk, being the lighthouses by night, and serving as beacons in the day-time; and, lastly, the *North-beacon*, on the N.W. shore of Neuwerk. Now if, from the seaward, you perceive the two towers or light-houses between the two beacons, you will be directly off the entrance of the Elbe.. Nevertheless as it happens very often that those buildings are not early enough to be seen, being too far distant, the best sea-mark, or signal, for the entrance is a *signal-vessel and floating-light*, which is stationed at the mouth of the river, two miles to the seaward of the red buoy, in 11 fathoms at low water, and at high water in 13 fathoms; from this vessel the red buoy, the Schaarhörn-beacon, and the great tower of Neuwerk, in a right line, bear S.E. by S. It is moored with iron chains, so as not to leave its station in stormy weather, unless when forced by the ice in the winter, or by a hurricane and extreme necessity. This vessel will most commonly leave her station only in January and February, but at times she may be forced by the ice to withdraw sooner and return later; as, on the contrary, she may sometimes, though seldom, happen to keep that station uninterrupted all the winter season. Being to seaward of the entrance, at 3 leagues from Neuwerk, she is easily to be discovered by the approaching ships and vessels, and is distinguished by carrying on the top of the great mast a red flag. In night-time she will carry a lantern-light, 38 feet above deck; and in a fog, or misty weather, when commonly no wind blows, she will, in every quarter of an hour, ring a bell during one minute. If vessels coming in, and being already in sight, should by rain and snow disappear again, the signal-vessel is to fire guns from time to time.

A second vessel, viz. the *pilot-vessel*, resembles the signal-vessel, and has her station, in fair weather, by the red buoy; and, in bad weather, at the Flügel-ton, near Neuwerk, about 3 leagues within the first signal-ship. She carries her flag on the flag-staff from the taffarel.*

From the 15th of September, 1827, a second signal-ship has been stationed between the

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* MOUTH OF THE ELBE. *Pilot Station.* Notice, by order of the Navigation and Harbour Board, dated *Hamburg*, March 9th, 1835.

"As the channel at the mouth of the Elbe, off the Flugel tonne, has shifted, and in consequence thereof, when the pilot galliot is laid there on account of stormy weather, the pilots can no longer board vessels with due safety, a new station has been appointed for the galliot, which is more convenient for vessels entering the Elbe; and this new station will be occupied by the galliot when requisite, after the 1st of April, 1835. Therefore henceforth, when the pilot vessel is obliged to quit her station off the red buoy, on account of stormy weather, she will no longer proceed to the Fluge' tonne, but will anchor within the triangle, formed by the buoys D, C, and No. 6, wh white buoys, No. 3 and 4, in the entrance of the Elbe, near the Sand Riff where the fair-way divides.

The course from the first signal ship toward the second is S.E. by E.; the distance about 5½ miles. The bearings of the latter are N.E. by E. from the Schaarhörn-beacon, and N. ½ W. from the great Neuwerk-tower. She is moored in 11 fathoms of water, and keeps station the whole year until driven away by the ice.

This vessel has the rigging of a galliot, and is distinguished from the first signal-ship by having in the day-time a blue and white flag, horizontally divided, hoisted at her main-mast head. During the night, two lights, 18 feet apart, will be hoisted one above the other.

DIRECTIONS FOR SAILING INTO THE ELBE BY DAY.

1. Having discovered the signal vessel stationed outside the red buoy, bring her to bear S.E. by S. from you; then and on that course steer up to her, and if the wind is south-westerly, proceed two miles farther, where you will find the red buoy. Hence set your course E.S.E. for a league, and you will have the North-beacon in one with the great tower of Neuwerk, and be between the Schaar-ton and the white ton No. 1, having the pilot-vessel, stationed at the Flügel-ton, in sight. Or, if the wind be north-easterly, set your course from the signal-vessel S.E. by E., for 4½ miles, when you will come in the middle between the white buoy No. 1 and the Schar-ton; then you may steer more southerly, S.E. by S., toward the Flügel-ton, where perceiving the pilot-vessel, and steering up to her, you will most certainly receive a pilot to bring you farther up the channel.

While without a pilot, and on the way from the signal to the pilot vessel, about 3 leagues, attention ought to be paid to the tide and currents. In the beginning the flood sets north-easterly against the tail of Vogel sand, toward half-tide the current comes directly in the channel upward, to abreast the *Hundeballje*, near Neuwerk, where the current may attract the vessel somewhat southerly. Now and then a buoy will also be observed upon the pitch of the rolling waves, when carefully attended to; sometimes the fairway may be distinguished by the breaking of the sea against the edges of the sands.* Above all, care must be taken as to soundings in advancing toward the shoals, and you must endeavour to keep the fair-way between the buoys; there is no difficulty in so doing and steering without a pilot from the signal to the pilot-vessel, at the Flügel-ton, if the weather is favorable enough for seeing the buoys; since you only observe, in going up the channel, that the *black buoys are to be left on the starboard, and the white on the larboard, side.*

2. *But if the signal-vessel should not be on her post,* outside the entrance of the Elbe, on account of the ice, or by other accident, and likewise at the same time that all tons and spars, or ice-buoys, should be driven away by the ice, and nevertheless you are resolved to sail in, being in about 12 fathoms, and seeing the sea-marks from Neuwerk distinctly: then observe that, in this case, the wind must necessarily be to the west and southward, it being impossible, on account of the ice, with easterly and northerly winds, to arrive at Cuxhaven. But if the wind be favorable, bring Schaarhörn-beacon to bear S.E. by S. from you, and in one with the great tower on Neuwerk; then you will be at the mooring-place of the signal-vessel, and may proceed by the preceding directions, steering first S.E. by E., afterward southerly to the *Flugel-ton;* where, or perhaps sooner, an Ever (fisher-boat) with pilots from Cuxhaven will meet you; the pilots, in time of ice with south-westerly winds, going daily out and in, for the assistance of vessels coming in.

At every time, when the great tower from Newerk appears about midway between the North-beacon and Schaarhörn-beacon, you will, standing in with these marks, pass the red buoy on the east side, near enough to see it, if not removed from its place; from which, steering E. by S., you will certainly meet the entrance of the Elbe, and see the black buoys, or the ice-buoys, provided they are not destroyed. In the mean time make use of your lead and the landmarks, and do not trust too much to the buoys; which sometimes are driven out of their places by the current and high sea.

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* For instance: with a S. and S.W. wind, the breaking of the sea at Schaarhorn will be short and irregular, like the surface of boiling water; when, on the contrary, the breakers on the Vogel Sand are long, and the fair-way between these banks is smooth. With a hard wind from N.W. the breaking seas are general.

3. Supposing that no other mark than the Schaarhörn-beacon should be in sight, bring this beacon to bear S.S.E., and upon that course stand toward it into 9 fathoms; at this depth bear off, steering East or E.S.E., and, having deepened your water to 11 or 12 fathoms, luff-to again: in this way you may proceed along the Schaarhörn-sand, till near enough to discern the towers and houses of Neuwerk.

It speaks of itself, that, by this manner of entering the Elbe, the lead ought always to be going; the sand of Schaarhörn being all along very steep; and that, by the same reason, this way is adviseable only in the supposed case of the wind being south-westerly. With northerly and easterly winds the side against the Vogel Sand is preferable, although you should lose by it the sight of Schaarhörn-beacon. Having the chart at hand, which shows the depth of the channel and the position of the sands, one may easily determine the best course to be taken hence, according to the circumstances of wind and tides.

Generally it may be observed, that the courses from the entrance of the river to Cuxhaven change 4 or 5 times. For instance, from the signal-vessel till upon the marks of the Schaar-ton and white buoy No. 1, the course is S.E. by E., distance 4½ miles; from the red buoy till upon the marks of the said Schaar-ton, the course is E. by S. ½ S., distance one league; from that to the Flügel-ton (a black buoy with an iron vane on it) the course is S.E. by S., distance 3½ miles; from the Flügel-ton to near the buoy L, the course is S.E. by S., distance 2 leagues; from the latter buoy to Cuxhaven, the course is South, one point to the westward or eastward according to the current being flood or ebb; the distance is one league. The said courses are the bearings of the channel; the true way of the vessel being always determined by the wind and currents.

We shall add the marks upon which the said buoys, where the course changes, are laid; viz.—

The marks for the *Red buoy* are, Schaarhörn-beacon and the great tower in one; it lies in 10 fathoms.

Those for the *Schaar buoy*, (and the white buoy No. 1): the North-beacon and great tower of Neuwerk on with each other; depth, 8 fathoms.

Those for the Flügel-ton (vane-buoy): the easterly house of Neuwerk and great tower in one; depth, 6½ fathoms.

Those for the buoy L: the hill of Sahlenburg in the middle between the village of Duhnen and the mill at Döse.

DIRECTIONS FOR SAILING INTO THE ELBE BY NIGHT.

Although we must allow, in general, that vessels ought to sail only in the day-time, and in night-time should not even approach the entrance nearer than 2 or 3 leagues without the red buoy, in 13 or 14 fathoms of water, yet different circumstances may very well admit of exceptions to this rule. For instance, if a ship wants anchors and cable, or if she is forced by hard stormy weather to run in; or she has a dangerous leak, &c. Here we may add the case happening often in warm summer days, when, by the rising of a great quantity of shining vapours, the air becomes hazy near the horizon, and obscures the sea-marks; whereas the commonly following fresh and clear nights give a good sight of the lights of Neuwerk, by which a ship may sail in with more safety perhaps than at the high noon-day, when the eye is overpowered with light and the horizon with exhalations.

Being, therefore, determined, by necessity or by choice, to sail into the Elbe at night-time, and having advanced so far as to have both lights on Neuwerk, which are not far from each other, in sight, you must approach them in order to bring them about S.E., then you may, according to the season and time of the year, either,

1st, Be sure of the signal-vessel or floating-light being at her assigned station; and, in this case, steering somewhat more southerly, till you discover, when in about 13 fathoms of water, the great lighthouse, bearing S.E. by S., then you will see the lantern-light* of the signal-vessel, and bearing toward her, there is no doubt but you will find the entrance of the Elbe, steering, as said before, from the signal-vessel S.E. by E.

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* To prevent any mistake between the lights from Neuwerk and the floating light, remark, that the former being much stronger, will, in clear weather, be seen at a greater distance at sea, and shine sparkling like two scintillating stars; whereas the shine of the latter will be faint and tranquil, but will increase in strength on approaching.

Or, 2dly, *If in frost and winter-time* you dare not trust to the presence of the signal-vessel, then, having both lights from Neuwerk in sight toward S.E. by S., when in about 14 or 13 fathoms; steer East, to bring them both together, when they will bear S. by E. ½ E.; proceed upon this course, keeping the lights constantly in the same direction, only the higher light always so much to the westward as is required to prevent confusion and mistake; then you will pass over the tail of the Vogel Sand with soundings of 5 to 7 fathoms, according to the tide; and going on that way, you will deepen your water gradually to 8, 9, 10, or 12, fathoms, which proves your being then in the fair-way of the channel. Here the light from Cuxhaven may also be observed, but too distant to regulate the course by it. Being, therefore, arrived in 10 or 11 fathoms, with about half-tide, bear away and stand to S.E., till you perceive the low light wandering over before the high, to the westward, distant the one from the other about half a handspike's length, or rather, half the diameter of the moon. Discerning the lights distinctly in this position, you will be upon the marks of the Schaar-ton, and may steer, as already directed, S.E. by S. toward the Flugel-ton, where the high light bears S.S.W.; and there being a tolerably good roadstead, you may ride till day-light, when buoys and marks are to be seen, and also the pilot-boat from Cuxhaven, which will meet you.

But if, from want of anchor and cable, you must proceed in the night-time to Cuxhaven, keep your lead constantly going, and observe the lights of Cuxhaven and Neuwerk. The soundings toward the Vogel Sand are so regular that you may trust to them, and keep in 5 or 6 fathoms. With the high light of Neuwerk bearing W. by N. and that of Cuxhaven S.S.E., you are abreast the buoy K, called the *Bösch-ton*; from thence upward the channel grows larger and deeper, and by the courses S.E., S.S.E., and lastly South, you can hardly mistake to bear in with the harbour, it being lighted by the contiguous lighthouse.

3dly, In case the wind be too scant for sailing in upon the marks above given, viz. both lights of Neuwerk on with each other bearing S. by E. ½ E., you may, at the appearing of the low light, in a distance of about 3 or 4 leagues from Neuwerk, steer one point more easterly, viz. S.S.E. ½ E.; after having brought the lights to bear to that rhumb of the compass, then they will appear the higher to the westward, distant from the lower about a handspike's length. Keep the lights constantly in that position, when proceeding to them, which will be done either by the ship making lee-way or by bearing gradually a little to the eastward, when coming nearer. In this manner you will cross the tail of the Vogel Sand in 8 to 9 fathoms of water, and find, when in the mid-channel, and near Schaarhörn, 10, 12, to 13, fathoms, whereupon you must bear off, steering E.S.E., till the lights are wandered over, the low to the westward of the high, as above explained: then, being in the marks of the Schaar-ton you may run up S.E. by S. to the Flügel-ton.

This last method of entering the Elbe by keeping the lights distant a handspike's length one from another, is only adviseable with southerly winds, when you may approach the Schaarhörn sand without danger, and take accurate soundings there; it is also only in this case of a scant wind, when it is required. In case of the wind being large, the first method of sailing in by keeping the lights close on with each other, is preferable for giving a more accurate mark of the course, and, at the same time, more difference of the soundings at Vogel Sand and in the channel, consequently more certainty of the ship's way and place. Have a care, not to sail higher over the Vogel Sand than as here described, nor to bring the low light to the westward of the high, before you are sure of your being in the channel, in about 9 or 10 fathoms of water. As the lights may sometimes dazzle the eye and appear in one, though different in height and position, you will do well by looking at them now and then with a telescope.

Ships having the misfortune of running aground on Vogel Sand, in stormy weather, with W. and N.W. winds, are commonly lost with men and goods; whereas under the like unlucky circumstances at Schaarhörn Sand, the men, retiring to the beacon, are usually saved, and some goods may here be preserved.

In all cases there is good anchoring ground every where seaward before the Elbe, and many a vessel, being but scantily provided with anchors and cables, has been saved in a heavy north-west gale by cutting away the masts and riding out the storm, when others sailing in at the same time were unfortunately lost.

DIRECTIONS *for* SAILING *into the* ELBE, *while the* Second Signal Ship *is on her station.*

So soon as a vessel arriving gets near the first signal ship, bring this one in with the second ship, and steer S.E. by E. toward the latter.

By so doing they will see at once the signals of both the two floating-lights, steer the right course, and avoid the dangers of the Vogel Sand and Schaarhorn.

Having reached the second signal ship, to avoid falling upon or behind the Sand Riff, you pass her to the southward, and then steer S.S.E. ½ E. toward Neuwerk.

After having thus sailed three miles, you will be near the Flügel-ton, where the bearings of Neuwerk-lights will be S.S.W. The best anchoring-place under Neuwerk is here. The cruising-pilot vessel, when not longer holding sea, usually also anchors here. She carries for a night signal, a single lantern at her stern.

The second signal-ship is also under orders to fetch over the pilots, from vessels going to sea, and is fully manned for that purpose.

Masters of vessels entering the Elbe in ice-time ought to be aware that the signal-ships may be compelled to quit their station and take to sea. In this event they are to consider the great risk of entering the river, when those signals are wanting; if they cannot avoid entering, they will pay the greatest attention to the instructions respecting the two Neuwerk-lights, the beacons and other sea-marks, and the Heiligoland pilots.

GENERAL REMARKS *on the* NAVIGATION *of the* ELBE.

For sailing into the Elbe, be it by day or night, an exact knowledge of tides and currents is always required. On the days of change and full moon the time of high water at the entrance of the Elbe is 12 o'clock; at every day before or afterward it flows 50 minutes sooner or later. The ebb runs 6 hours 25 minutes, whereupon the flood begins and continues 6 hours. The current comes never quite to a stand, it changes only its direction and force. The ebb at the red buoy sets in the beginning S.W., then West, and N.W., at last northerly; and in that direction the flood goes gradually north-easterly, east, then south-east directly in the channel.

At *Cuxhaven* the ebb begins one hour later than at the red buoy, continues 6 hours 45 minutes, and is then followed by the flood during 5 hours 40 minutes. In the road the current does not cease entirely, the flood continues rather running in till ¾ or ⅓ of an hour after the waters falling at the south shore. Between Cuxhaven and the mouth of the river the velocities of the currents are greater than outward at sea, being in the channel mid-tide ebb, when strongest, about 3 to 4 nautical miles, and with the flood from 2 to 3 miles per hour, according to the moon's being half, or full, and change; in the first case the perpendicular fall and rise of the water being 8½ feet, in the last 11 feet.

The best time for coming into the Elbe, wind and weather being favorable, is about 1½ or 2 hours after the beginning of the flood, when the tide begins to set right in; but in bad and stormy weather, with westerly winds, it may be preferable to run in 1 hour before high water, since by the extraordinary rise of water, caused by the stormy sea-winds, the vessel may pass over many sands and shoals without touching, which would be nearly dry at low water time; besides, if unluckily running aground, she will not be exposed for a long time to the violent shocks upon the ground by the high seas and breakers.

As to the clearness of the sight of the sea-marks on Neuwerk, the most suitable time for entering the Elbe, in the summer-season, is either early in the morning or in the afternoon, to avoid the beamy light reflecting from the air and water and dazzling the eyes.

When going up or down the river, beware of the *Balljes*, or inlets of the sands, which hollows will, by the flood setting in, attract the vessel, when approaching too much in a calm. It is also a calm which causes generally a thick and foggy air, obstructing all sight of marks and buoys; but then a boat may very well guide the vessel by running before her. In general, we may remark that, with fair weather, the navigation of the Elbe has been rendered as easy, by the liberal establishment and improving of the sea-marks, signals, buoys, and pilot-vessels, by the government of Hamburg, as any seaman and trader can wish and desire. Under unfavorable circumstances, there will always remain some difficulties, but of such a nature, however, that qualified active seamen will generally overcome them by caution and activity.

Before Cuxhaven you will find every where a good anchoring ground; but if compelled by the ice to run into the harbour, the best entrance is near the *Alte Liebe*, on the north or starboard side; but in case of the harbour's being filled up with ships, that you cannot enter it, you may go beyond the Schutzhöft or breakwater upward, and enter within it from the southward, where you will find complete security against the ice.*

DIRECTIONS *for the* RIVER EYDER, *&c.*

From Heiligoland steer for the Eyder, according to the Chart, with a sufficient allowance for the stream, until the high spire steeple of St. Peter's bears E.N.E. Then bring the beacons on the north side in one, by which you will make the first black buoy.

A Light-vessel stationed at the mouth of the River, between February and November, has two masts, and her sides are painted red, with a white streak. By day, a small Danish flag is displayed at the fore-top, at 60 feet above water, and by night a lamp is exhibited at the height of 34 feet. With the vessel bearing E.S.E. it may be approached with safety. Pilots are on board for Husum, Tonningen, and the Elbe. The discharge of a cannon and tolling of a bell, in thick weather, indicate that a vessel in sight is taking a wrong direction.

The channel to the river is regularly buoyed, as shown on the Chart, with white buoys on one side and black on the other, and the passage above is generally indicated by beacons fixed on the sands, with several buoys.

From the first black buoy, in clear weather, Heiligoland may be seen, bearing nearly W.N.W.

The different reaches upward become circuitous; and, in sailing up or down either of them, the greatest caution is required: consequently the lead must very frequently be hove. The beacons on the banks stand, mostly, dry at low water: and, at high water, should not be approached too nearly. Strangers, therefore, cannot venture without a pilot; and, this being the case, a farther description of them would be superfluous.

CANAL.—For the purpose of facilitating the communication between the North-Sea and Baltic, a canal is formed across the Duchy of Holstein, from the River Eyder, which passes by Rendsburg, to about 3 miles north of Kiel, at the mouth of the River Lerwensawe, which heretofore separated Holstein from Sleswick. The Eyder is navigable more than 6 miles above Rendsburg, and the distance from the western sluice of the canal at Rendsburg, to its commencement near Kiel, is 20½ English miles.

The perpendicular fall of the canal, toward the Baltic, is 25 feet 6 inches; that toward the North-Sea, 23; and, vessels passing through, are raised or let down by means of six sluices. The breadth of the cut is 100 feet at the top, and 54 at the bottom; the sluices are 27 feet broad, and 100 feet long, and the lowest depth of water is 10 feet. Merchant-vessels, of about 120 tons, may, therefore, navigate the canal.

The chief object of this work was, to draw by Kiel, into the Baltic, the commerce of Bremen, Hanover, and Westphalia, before carried on down the Weser, and by Gluckstadt, upon the Elbe, to Hamburg and Lubec; and, also, to facilitate the transport of merchandise from Holland and the North-Sea to the ports of the Baltic. But the difficult navigation of the Eyder, between Rendsburg and Tonningen, occasioned by the numerous shoals of shifting sand, prevents the expected success of the canal; and vessels sailing from the North-Sea to the Baltic, or from the Baltic to English or French ports, will, for ever, prefer the navigation round the Cattegat, with all its dangers and difficulties.

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* Ost or East River, (11 miles above Cuxhaven). An official notice, dated Cuxhaven, 30th of April, 1828, stated that two small sea-buoys, with black vanes, had been placed at the mouth of this river, toward the Belum outer dike, where there were two wrecks. But two large sea-buoys, one black and the other white, still denote, as heretofore, the channel into the Ost River, where it falls into the Elbe. But in autumn, and thence until spring, the channel at the entrance of the Ost River will be marked out only by common buoys. Care must be taken not to approach too near.

RIVER EYDER *to the* SKAW POINT.

AMRUM BEACON.*—For the safety of vessels which are bound for the harbours or rivers in the neighbourhood of Heiligoland, and may be carried, by accident or otherwise, to the northward of that island, a beacon has been erected on the sand-bank, which lies 4 miles to the south of Amrum, and to the west of the Isle of Pillworm; and which, in ordinary floods, rises 5 feet above the surface of the water. The height of this beacon is 60 feet. It may be seen from the distance of 12 miles, appearing, at first, like a sloop with a top-sail set. From the light on Heiligoland, the beacon bears N.E. by E. ½ E. distant 25 miles.

The advantages to be derived from this beacon are as follow:—1st. It serves to point out the sand-banks in that part. So soon as it can be distinctly seen from the deck, the vessel must not approach nearer; for then the soundings will be from 6 to 5 fathoms, and the distance 8 miles. 2d. The beacon serves also as an excellent mark for enabling vessels to regulate their course. When it is seen at the distance of 8 miles, and bearing East by compass, it gives the following magnetic courses and distances; regard being always had to the state and direction of the tide.

To the island of Heiligoland	S.W.	18 miles.
Outermost red buoy of the Elbe	S. ¾ W.	30
Outermost black buoy of the Eyder	S.S.E.	23
Outermost red buoy of the Hever	S.E. by S.	12
Outermost black buoy of the Schmal-deep	S.E. by E.	4½
Lister-deep	N.E. by N.	18

3d. The beacon farther serves as a principal mark for directing the navigation to these deeps and rivers.

TO MAKE THE SCHMAL DEEP.—The beacon must be brought to bear N.E. ¾ E. from the vessel; and this course must be kept till within 4 miles of the beacon, where the Pillworm Old Tower bearing E. by S., the outermost black buoy of the Schmal Deep will be found in 4½ fathoms. In clear weather, the beacon may be brought within an eighth of the compass to the east of the outermost corner of Amrum, and the Pillworm Old Tower between North and South Oog, (or Oye,) but nearer to the first, in the proportion of one to two.

TO MAKE THE HEVER.—Let the beacon be brought 8 miles to the east; then let the above-mentioned course, S.E. by S., be kept till North Hoft, (or Head,) that is, the N.W. of the land of Eydersted, is seen E.S.E., or till the church and steeple of Wester Hever come clear of the Sand Downs. Then the beacon, which can be distinctly seen, bearing north, by compass, the outermost red buoy of the Hever will be discovered.

TO MAKE THE EYDER.—Let the beacon be brought 8 miles to the east: and let the course be S.S.E. till the beacon disappears to the north. The Sand Down of Eydersted will then be discovered, and the course must be continued so long to the southward, in from 4 to 3½ fathoms, till the two beacons on Sud Hoft, or at St. Peter, appear in a straight line E.N.E., when the outermost buoy will be seen.

LISTER DEEP.—In the same manner, the beacon is of advantage for making the Lister Deep; for, as soon as it disappears to the south, the Island of Sylt is discovered; and, when the middle of the island, called Roth Cliff, appears in the east, the coast may be directed northward, very near the coast, till the point of it is reached; then, hauling to the east and south-east, good anchorage may be found behind the Liest.

VARDÉ.—The harbour of Vardé lies to the S.E. of the Horn Point. It has upon the bar not less than 18 feet at high water. There are two buoys at the entrance; the first black, the second white. The former is to be left on the starboard, and the latter on the larboard, side. The harbour may be known by a small white steeple on the north side; but strangers should not venture without a pilot.

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* The description of this beacon is here given from the original notice, as published by authority in Denmark. But it is to be observed, that it does not correspond, in several particulars, with our Charts.

The bearing and distance from Heiligoland to the Horn Point are, N.N.E. ½ E. 27½ leagues. In steering for the point, care must be taken to avoid the extensive shoals called the Horn Reefs, which are very dangerous, as they extend nearly 8 leagues to the west of the point, and are nearly dry at low water, to the distance of 4 or 5 leagues out. In order to avoid these shoals, in sailing from Heiligoland to Bovenbergen, the course must be first N. ½ E. 30 leagues, and then N.E. 20 leagues. From Bovenbergen to the Holmen or Holms, the course and distance are N.E. ½ E. about 11 leagues. The Holms should have a berth of nearly 2 leagues, as there are several rocky shoals to the northward of the point; especially a bank, called the Stone Bank, which has only 10 or 12 feet over it, and which lies N.N.E. only 5 miles off.

The soundings in approaching the Holms will be found variable: for instance, with the Holms E.S.E. 16 leagues distant, there are 35 fathoms, coarse sand and stones; at 11 leagues, 42 fathoms, fine grayish sand, with black specks; with the Holms E.S.E. ½ E. 25 leagues, there are 34 fathoms, coarse sand and shingle; at 19 leagues, same depth, fine red sand; at 10 leagues, variable, 15 to 25 fathoms, chiefly fine sand, with pebbles, &c.

With the Holms S. by E. ½ E. 7 leagues, you will be on the edge of the Jutland Reef, in 48 and 50 fathoms, sand and shingle; and may thence steer East for 27 leagues, which will lead up to abreast of the Skaw Point. The edge of the bank or reef is steep-to, there being from 60 to 80 fathoms close to it, with muddy ground; and upon it from 40 to 16 fathoms, with variable soundings.

In thick weather, particular attention must be paid to the current, which, in strong northerly winds, sets to the southward at the rate of nearly one mile an hour.

With the Holms S. ½ E. 10 miles off, there are 25 fathoms, sandy ground. From this spot the land will appear like three hills or islands, the adjacent land being too low to be visible. There is a church upon the S.W. part, by which it may be known.

The round bluff land called *Robsnout*, is sufficiently high to be seen, in clear weather, at the distance of 6 or 7 leagues. On its top stands a church with a spire-steeple. The land is low on both sides: to the eastward it falls into a bay, which extends 8 miles N.E. by E. ½ E. to *Harshals*, where it has the appearance or form of a saddle. Between these places the land is low and sandy, and the only remarkable object is a church with a square white steeple. Harshals is a long smooth hill, rather low in the middle, but apparently steep at the eastern end.

In the vicinity of Robsnout and Harshals there are several rocky reefs and other shoals, some of which are nearly 7 miles from the shore.

The bearing and distance from Harshals to the Skaw Point are nearly E. ½ N. 8 leagues. The coast between is low. Without this course there are two banks, nearly parallel to, and about 5 miles from, the shore, upon which there are from 6 to 10 fathoms. Within them there are from 12 to 17 fathoms.

THE SKAW POINT is very low, and has a lighthouse on it, which is kept white, and is lighted all the year. This tower, formerly, had a coal-light, at 63 feet above the level of the sea, but is now a regular fixed lamp-light, which may be seen by night, and the tower by day, at about five leagues off. From the point extends a rocky reef 2½ miles; its north-east extremity lying with the church and lighthouse on with each other, bearing W. by S. The north side of this reef is steep; you should not approach nearer to it than in 10 fathoms of water. When you intend to anchor under the Skaw, on the south side, bring the lighthouse to bear N. by W., in 8 or 9 fathoms of water, and you will have very safe riding with westerly winds.*

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* NOTICE from the Royal Board of Customs at Copenhagen, 18th of Sept. 1832.—"As it may be of importance to all ship-masters who, in the winter, or in the early part of the spring, are coming from the Sleeve to the Cattegat, to be informed if there be any drift ice in the Cattegat, it has been ordered that a white flag, with a blue perpendicular broad stripe in the middle, is to be hoisted, during the day-time, from the lighthouse upon the Skaw Point, as often and so long as ice may be seen from the lighthouse, to such an extent, or in such a quantity, as might be supposed to obstruct the navigation in the Cattegat," &c. See further, our *New Sailing Directory for the Cattegat and Sound*, pages 2 and 3.

ANHOLDT.—Notice was given, in April, 1836, that the lighthouse on the Isle of Anholdt, in the Cattegat, had been re-constructed, and would, in future, instead of a coal-fire, have *a fixed lantern light*.

AGGER CHANNEL, from the NORTH SEA to the CATTEGAT.—Early in the year 1836 it was announced that the sea, by an irruption, had formed an opening between latitude 56° 42′ and 56° 43′, which has since so increased as to admit small vessels to pass, by the lakes of Jutland, from the North Sea to the Cattegat, and of course, to the intermediate towns of Lemvig, Nikiobing, Logstor, Nibe, and Aalborg. In April, 1836, the Danish Admiralty sanctioned a pilot establishment here, and gave notice that vessels entering might obtain pilots for the places above-mentioned.

"According to the soundings which have been taken at different periods, the depth of the western entrance varies from 5 to 7 feet; and of the eastern entrance from 5½ to 6 feet. In the channel itself, which affords good anchorage, the depth, both from the frith and the sea, increases to 18 feet, which depth, however, is subject to continual changes. The mouth of the channel, toward the North Sea, is about half a Danish mile wide, [two nautic miles,] but farther up, toward the frith, it declines from 250 to 50 fathoms; its length from the sea to the commencement of the frith is supposed to be three-quarters of a Danish, or three nautic miles."

To the south of the entrance, on a sandy eminence, and near a temporary watch-house, has been placed a signal-post, the flag of which, hoisted at the top, signifies that the vessel has been observed, and that the assistance of a pilot is offered. The said flag being lowered *once*, denotes one foot of water; twice, 2 feet; three times, 3 feet; four times, 4 feet; five times, 5 feet; six times, 6 feet; &c. After this the pilots go out toward the vessel that makes the customary signals.

"The rate of pilotage, according to a tariff exhibited in the pilot office, has been fixed, for the present, at two rix bank dollars silver, per foot of the vessel's draught of water; and, in the winter season, at one-third more, which rate will eventually be reduced, should the navigation of the channel increase."

TIDES *between the* TEXEL *and* SKAW POINT.

THE tide in the Texel has been already noticed; the time of high water, on the full and change, at the entrance of the Holleport, is at 7 h.; in the Vlie Stream at 8 h.; at Harlingen, 9 h.; at the entrance of Oost Gat, 7 h. 45 m.; entrance of the N.W. Gat of Ameland, 9 h.; Vriesche Gat, 9 h.; the Slenk of Groningen, 9 h. 30 m.; Entrance of the Western Ems, 10 h.; Borkum, south side, 10 h. 30 m.; Delfzyl, 11 h. 15 m.; Wangeroog and mouths of the Elbe and Eyder, 12 h.; Heiligoland, 11 h.; Schlussel buoy of the Weser, 11 h. 30 m.; harbour of Lehe, 1 h. 45 m.; Braake, 3 h.; Vegesack, 4 h. 15 m.; Cuxhaven, 1 h. 5 m.; Gluckstadt, 3 h.; Hamburg, 5 h. 6 m.; Harburg, 5 h. 26 m.; to the northward of the Horn Point, 3 h.

The vertical rise of spring-tides, off the islands of the Dutch coast, is about 10 feet, but within the Vlieland and Terschelling only 5½ feet; in the Zuyder Zee, at Harlingen, 4 feet 4 inches; Ameland Gat, 6 feet; in the Vriesche Gat, 8½ feet.

In the Ems, the water, with ordinary tides, rises 8½ feet, unless influenced by wind and weather. In the Wad or Wadden, 8 feet; more to the east the flood and ebb decrease.

At Heiligoland the vertical rise is 9 feet: at the Schlussel-ton of the Weser, 11 feet; at Lehe, 9 feet; Braake, 7 feet; Vegesack, 3½ feet; Red buoy of the Elbe, 11 feet; Cuxhaven, 9½ feet; Gluckstadt, 8½ feet; Hamburg, 6½ feet; Harburg, 3½ feet. Near Bovenbergen there is very little rise and fall; and the water in this part generally takes its motion according to the prevailing winds, but most commonly to the north-eastward. It is, however, to be observed that, to the southward of the Horn Point, and between it and the Texel, there is generally found a set or indraught toward the S.E. toward the Elbe and Weser, for which due allowance should be made.

For a more particular description of the Tides in and near the Elbe and Weser, see page 189.

SECTION XII.

GENERAL REMARKS *on, with* DIRECTIONS *for, the* NORTH-SEA, *in passing over from the* Thames *to the* Cattegat; *with a Description of the* Southern Coast *of* Norway.

In leaving Hosley Bay, or Orfordness, vessels will clear the Ridge and Aldborough Knapes, by attending to the sailing directions given in the former part of this work. When clear of these shoals, the general courses, thence, to the Naze of Norway, will be as follow: First, E.N.E. (N.E. ½ N. true) 15 leagues; secondly, N.E. ¾ N. (N. by E. true) 18 leagues; and, thirdly, N.E. by E. (N.N.E. ¾ E. true) 100 leagues.

We can give no better descriptions of the banks and soundings, which will be found in these courses, than those laid down on the Chart. The first course, E.N.E. 15 leagues, will lead to a good berth to the S.E. of Smith's Knoll, and to the spot marked 27 fathoms on the Chart. The second course, N.E. ¾ N. 18 leagues, will lead upon the S.E. side of the Well Bank, in 17 fathoms, olive-coloured sand; leaving the Swarte or Black Bank on the starboard hand; and, the last course, N.E. by E. 100 leagues, will lead thence to the Naze, or rather to the eastward of the Naze, of Norway.

It now remains for us to remark, that the reckonings of vessels through the North-Sea are frequently rendered very inaccurate, by the variable currents, which depend on the wind. Of these currents, those in particular, who sail from the westward, should beware, when bound to any part of the coast between the Texel and the Skaw; as it is very common to find the apparent distance from 20 to 30 miles less than when sailing in the contrary direction, to make the coast of Britain; but, particularly with S.W. winds, which cause a constant current to the eastward and N.E., that commonly sets across the Jutland-reef and south side of the sleeve, toward the Skaw; or, by varying in its direction, according to the wind, setting more to the west, and along the coast of Norway. Be, therefore, extremely cautious that the northerly current does not set you upon the coast of Norway, especially in the night.

Between the Naze of Norway and the Orkneys there is, very frequently, a current, which takes its course with the wind; particularly when it blows from the southward or northward; but generally it runs strongest toward the north. After a long-continued southwesterly wind, it sometimes runs at the rate of two knots, between these places.

It has also been frequently observed that, in sailing from the Naze to Fair Island, the distance has sometimes appeared from 5 to 10 leagues shorter than the distance shown on the Chart; which may be ascribed to currents setting to the north and west, and caused by southerly or easterly winds.

GENERAL RULES *to be observed in* SAILING *to and from the* CATTEGAT.

Those having the charge of a ship or ships, bound from the Thames to the Cattegat, should get well to the northward, and not make too much easting; lest, being caught by a N.W. gale, and consequent current to the S.E., with flood-stream in the same direction, they be driven on the shoals of the eastern coasts.

In Sailing from the Northward, they should keep sufficiently to the West, according to the wind, &c. In the winter season it will be most prudent to make Flamborough Head, on the Yorkshire coast, rather than come in at the back of Yarmouth Sands. Hence ships of the line may safely take a departure for the back of the Leman and Ower, and small ships the usual coasters' track.

Many ships have been lost within the Horn Reefs, to the southward of Bovenbergen: it is, therefore, particularly requisite that, when passing this place, you get well to the westward; that you may, in case of emergency, bear away to the N.E. for a port, &c.

If turning out of the Sleeve, with a westerly wind, keep over to the coast of Norway, and not to the southward of the edge of the Bank; as the current on that coast, near the land, always sets to the westward. If a vessel stands to the southward of Bovenbergen, with a N.W. wind, she is in great danger of being embayed there; as a current, with this wind, frequently sets to the S.E., at the rate of two miles an hour.

On NEGLECT of SOUNDINGS.—In reflecting upon the great number of vessels which have been annually wrecked near the mouth of the Tees, the Farn Islands, the Horn Reef, &c. it may rationally be conjectured that many have been lost from not taking soundings in time, and a disregard of those injunctions which have been given, on the necessity of taking such soundings upon an approach to these dangerous shores; more especially in the night or in foggy weather. Every mean, therefore, of *facilitating* this desirable purpose, should be encouraged and practised; and we may here, with propriety, recommend to notice the *Patent Sounding Machines* of Mr. Edward Massey, of London, which we hope to find will soon be brought into general use, as well in the navy as in the merchant service. An able and experienced surveyor, Captain *H. W. Bayfield*, R.N., has observed that Mr. Massey's sounding machine gives the exact perpendicular depth, independent of the effect of current or drift of the vessel, and strongly recommends the use of this excellent instrument. "It is not expensive, and will last, with care, for a long period of time; correct soundings may be obtained with it in 30 fathoms of water without heaving-to, if the vessel be not sailing at a rate exceeding seven knots; and no vessel ought to be permitted to run faster, in a thick fog, or dark night, when in the vicinity of land or other danger." There is no difficulty in the use of the machine, and it is sold accompanied with directions for setting, reading its indications, &c.

COAST *of* NORWAY.

THE coast of Norway is very high, and its bays and harbours are innumerable; but an access to them is rendered extremely difficult by the multitudes of small islands and sunken rocks that border the whole extent of the shore. There is, however, no occasion to fear the want of pilots, and those who will be found here are some of the best and most intrepid in the world. They come out in all weathers, and frequently when the sea is so high that they are obliged to sling themselves in a rope, and be taken in over the quarter. Commanders should make the usual signal in time, with their national flag, at the top, and fire a gun.

That portion of this coast, exhibited on the new Chart, has been laid down from the late excellent surveys made by order of the Danish government; which are accompanied by copious and distinct details of the operations on which they are founded, and by correct sailing directions. It is to these works that we are indebted for the following remarks.

LINDERSNÆS, OR THE NAZE, is well known as the most southerly cape of Norway.* It has, for many years, been distinguished by two coal lights at night; and there is now a light-tower upon it, which is always kept white, so as to be serviceable both by day and night.

The heights of these lights appear to have been considerably over-rated. The Danish Surveyors have said, "According to information, *for the certainty of which, however, we do not answer*, Markoen's Light is 420 feet, and that of Lindersnœs 320 feet, above the horizon." Subsequent information gives for the height of Mark-oe only 190 feet, and for that of the Naze 143 feet. The truth may probably lie between. It seems probable that these lights will hereafter be improved.

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* The Naze is a bluffish red land. Over it, a little inland, is the high land of Spangereid, generally capped in the spring with snow, and which, in clear weather, may be seen from the distance of 12 leagues from the coast.

Upon the island called *Mark-oe*, to the westward of the Naze, there is also a light by night, but no tower. The light here is erected upon the rock; and the island, though of small circumference, is so high, that the light is considerably higher than that upon the Naze; and, in coming from the west, will be seen much sooner.

In approaching within a few leagues of the land, you will certainly see both fires at once. Should you happen to be coming in between them, you must by no means bring the light on the Naze more southerly than S.E. by E., for otherwise you will be in danger of running on a rock called *Bispen*, and some ridges within it. But if, on the contrary, you should come in on the east side of the Naze, approach no nearer to the land, than so as to bring both lights in one, in order to keep clear of the rocky flat, called Gieslingen.* Should you come from the east, and see neither of the lights, or rather, if that of Mark-oe should be hidden by the high land of the Naze, you ought directly to stand out to the southward, until you can obtain a sight of Mark-oe, and by no means to approach nearer to the land than to bring the light, which may be in sight, to the N.W., and not to the westward of that bearing. Thus you will pass the Gieslingen in safety.

Should you come by day, from the west, with a strong gale of westerly wind, and wish to stop in one of the havens on the east side of the Naze, you will do best to go very near the point; and after you are from 3 to 4 cables' length within the passage, stand to the N.E., when the pilots will most likely be able to come out; but should even that be impossible, you may set a course toward the Gieslingen, upon which the sea constantly breaks, and off which there are two small ridges visible above water.

MANDAL.—Four leagues E.S.E. of the Naze, lies the entrance of Manne-fiord, the haven of the trading-town called Mandal. In proceeding for this place, you will of course first obtain sight of the Naze. The entrance of Mandal may be readily known by two hills upon the coast on the east side, called the Cow and Calf. So soon as you have approached so far to the eastward that these are no longer hidden by the island called Hille-oe, which is pretty high and pointed; or to the east directly off Manne-fiord, when the two hills appear in a line, or become hidden by the eastern land; you will be able to determine where you are, and may come forward somewhat nearer in, to the east of Hill-oe, where you will have a good mark in the yellow sand, which is on the west side of Mandal, and which may be seen very plainly at some distance from sea. Here a pilot may be obtained.†

HELLIS-OE.—At the distance of 15 miles to the eastward of the entrance of Mandal, and 4 miles westward of the island called Flekker-oe, lies the island called Hellis-oe. This place is distinguished by two towers, which serve as a mark for this part of the coast; there being no other remarkable objects hereabout; the land stretching evenly along. Off the coast, in this part, there are, at the distance of a league, more or less, a number of small islands and ridges.

The towers, above mentioned, are painted white, with a pretty high bar upon each, so that they may, in light weather, be seen very well at the distance of 3 or 4 leagues, and, though they are two, and stand near each other, yet they will never appear as one; unless you be quite within among the ridges; so that they afford a mark particularly useful, and not to be mistaken. After setting this mark by the compass, the considerate seaman will be able to determine where, according to circumstances, he had best stand in for the land.

Within Hellis-oe, which the towers stand upon, there is one of the best and most convenient stopping-havens upon the coast for ships of all sizes, including ships of war.

FLEKKER-OE HAVEN.—The west gat of the Haven of Flekker-oe lies 3½ miles to the eastward of Hellis-oe. This harbour is well known. Upon a small island in the bay is the fortress or castle, which is very remarkable when before the entry, and not hidden by Flekker-oe. The harbour will contain a number of ships, which are usually made fast by rings on the shore. The depth is from 14 to 18 fathoms; but, far off, the bottom is not every where good: it being, in several places, rocky; and in some parts, apparently clean, the cables will frequently be found damaged. Men of war, and other heavy ships, must lie south off the castle, where there is some sea when the wind blows straight into the opening. As there are passages to both sides, you have the advantage that, when you come from it with the winds from W.S.W. to North and E.S.E. With westerly winds you may also come easily from hence, within the ridges, to Christiansand.

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* This danger lies S.E. by E. 5 miles from the Naze. There is a passage between it and the Isles of Udvar, which lie to the N.E.

† FIVE very useful BEACONS, for distinguishing so many points of the coast to the eastward and north-eastward of the Naze, were erected by the order of the government of Denmark, in 1825. The figures of these beacons are engraved on the General Chart of the North Sea, as well as on the Particular Chart of the South Coast of Norway, published by Mr. Laurie. The first beacon, eastward of the Naze, is on the rock *Rivingen*, off Mandahl; the second is on *Ulvoe*, about 5 miles eastward of Flekker-oe, near Christiansand; the third on *Brekkestoe*, south-westward of Lillesand; the fourth on *Hesnæsoe*, eastward of Grimstad; and the fifth on *Sand-oe*, 3 leagues south-westward from Oster-Rusoer; and so different are the forms that no one can possibly be mistaken for the other.

At the S.W. end of Flekker-oe, there is a creek called *Grundviigkil*, wherein ships, which do not draw above 10 or 12 feet water, may stand to 3 and 4 fathoms, sandy ground.

CHRISTIANSAND.—Christiansand is one of the chief cities of Norway. It has a trade of some importance, and is much frequented by shipping, which may here be repaired, and obtain, in case of accident, all assistance that can be required.*

There are several good marks for standing in toward its entrance; particularly the two hills called *Turned-up Boat*, and another called the Baksteen. In coming along from the west, or from the south, toward the land, the white towers of Hellis-oe will be a good direction. When you are off Flekker-oe, to the southward, and at some distance to the east, toward and beyond *Randoerne*, [Randis Islands] the opening will be seen that is formed by Torrisdal's River, or which passes on the east of Christiansand, appearing as a small valley amongst pretty high hills; of which those on the east side especially are very steep. The small hillock seen upon the mountain is that called the *Turned-up Boat*.

Somewhat to the west of this hill will be seen the *Baksteen*, which resembles the crown of a hat, being very steep on the S.W. side. When coming near the mouth of the entrance, you will see the town with the bay; but you must then be somewhat toward the east side, or it will be hidden by Odder-oe, which is high.

The marks above mentioned will obviate all difficulty in sailing up to Christiansand, or to the East Gat or passage of Flekker-oe; and, if the weather be not uncommonly tempestuous, you will readily obtain a pilot.

The most southerly ridge, without Randoerne, may be approached within some cables' lengths, and all else the sea breaks upon. Randoerne are, in comparison with the other land, lower, and even.

Light-houses.—On the islet called Ox-oe, at the entrance of the Harbour of Christiansand, a handsome round tower, *white*, now exhibits a variable light, at 135 feet above the level of the sea. In clear weather the appearances of the light are as follow:

A *steady flame* for the space of two minutes and 55 seconds; then follows a short eclipse, succeeded by a *brilliant flash*; again, a short eclipse, after which it regains its original steady flame.

The strong flashes occur every four minutes, and may be distinguished at 20 miles off, while the steady light loses itself, as you recede from the lighthouse beyond 14 to 16 miles. The light shows as above all round the compass, and is kept up throughout the year.

In connexion with the Lighthouse on Ox-oe, above described, a *Harbour-light* is established on Odder-oe, at four miles N.W. ¼ W. from Ox-oe. The light on Odder-oe will be seen in clear weather from the lower rigging, bearing N.W. ¾ West; and, by steering this course, and continually keeping Odder-oe light in sight, all rocks and shoals will be avoided until within 20 fathoms of the light, when the course must be altered to N.W. by W. ¼ W.

Upon continuing on the last mentioned course, steering in between *Odder-oe*, and *Dybingsholmen House*, *two lower lights* on Odder-oe lighthouse will be seen; the one after the other. Having passed five cables' length from this light, you may anchor in 30 or 40 fathoms.

The light on Odder-oe is 25 feet high above the surface of the sea; it is lighted and extinguished at the same time as the Ox-oe light, with the exception of the two low lights, last mentioned, which are not lighted between the 31st of May and 1st of August.

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* A particular plan of the harbours of Christiansand and Flekker-oe, may be seen on the general Chart.

The angle of Odder-oe light is six degrees, as the fair-channel way between Ox-oe and the *Gronningen*, or N. by W. to N. by W. 6° W. The space between the rocks along Ox-oe and the Groningen, in which Odder-oe light is visible, is from 3 to 4 cables' length across. The proper course in, N. by W. ¼ W., is in the middle of this space, whence the Odder-oe light shows most brilliant. On either side its lustre diminishes as you approach the rocks to 1½ or 2 cables' length. *Variation*, in 1833, 21° 23′ W.

At Christiansand there are two harbours, of which the western one is the most frequented. The general way of sailing into this is, between Dybingsholm and Odder-oe. You may leave it, with all winds, to the north, between W. by S. and E. by S.; and, in calm weather, when the wind is somewhat aslant or unsteady, you may warp out, by means of rings fixed for that purpose.

In the eastern haven, which is at the south side of the town, or east of Odder-oe, ships may lie very well, especially those bound to the west, as they can come from it with a southerly wind, to the E. and S.E.

On the east side of Odder-oe, there is a safe and good harbour called *Hullet*, which is now fitted up for a quarantine haven, wherein all ships, from infected places, are compelled to come in, before they touch at other harbours.

In the mouth of Topdalsfiord, there is a very good and spacious stopping-place, called Wigehaven, which is much frequented by ships opposed by adverse winds, particularly those bound to the west. You can enter with winds from N.W. to E.S.E. The depth is various, from 20 to 4 fathoms.

GENERAL REMARKS.—It may be proper here to mention a circumstance, which though known, is not the less remarkable; that, although Norway lies so far to the north, and under a climate where the winter is severe and long, the havens, from Christiansand westward, never, or but extremely seldom, freeze up; and the out-havens, not in the least; where ships at such a time, coming under the coast, can find the first places of safety; neither is drift ice much known; for it can only happen, in hard winters, that the ice, out of the Cattegat and from the more eastern coasts of Norway, can drive against the land without Christiansand, and somewhat more to the west; and then it happens only in the latter end of the winter, as in the months of February and March; but, westward of the Naze, an instance has scarcely been known of the ice having been a hinderance to coming into any of the harbours that lie nearest the sea.

On the coast of Norway, above described, there is, apparently, no rise of tide; but allowance must be made for a current which commonly sets to the West and N.W., but which fluctuates according to the season and local circumstances.

APPENDIX.

REGULATIONS *of the* PILOTAGE *for the* HARBOURS *in* NORWAY.

Vessels are not to go into or out of the harbours of Norway without a pilot (if any one is to be gotten): one tenth of the pilotage to be deducted for the captain of the pilots, the remaining nine-tenths for the pilot.

The pilots must not, on forfeiture of their places, take more pilotage than this placard allows, except in stormy weather, where hazards are run, or more persons employed for saving people, ship, and cargo, or when she hath lost masts, sails, or rudder; the pilot may, in such a case, agree above the common rate. If the master refuses to agree, the pilot, notwithstanding, must do his duty, and the pay be settled by the oldermand and two disinterested persons; but, if either party be dissatisfied, the magistrates may attempt it; if their determination be also disliked, it may be appealed to the court of admiralty.

So soon as a pilot sees a ship in the offing, with her colours out a waft, he shall go with his boat without the outer rock, and continue on board her until safely moored. If, in clear weather, a ship put out a signal for the pilot, being in some danger, and no pilot appears, they ought to attend in that neighbourhood; and having no reasonable excuse, shall forfeit two rix dollars each to the poor. And the oldermand, for not keeping better order among the pilots, shall forfeit four rix dollars for the first neglect, five for the second, and lose his office for the third.

A ship having brought-to for a pilot, with his colours out, and none near at hand, the fishermen who have been used to officiate as pilots, may then take charge of the ship, and carry her in, recovering full pilotage for their trouble, without any deduction, though none but pilots may carry a ship to sea, except fishermen appointed by the oldermand.

That the pilot-boats may be known, they shall carry a red cloth in the middle of their mainsail; but when they cannot use it, shall show a white cloth at the end of their sprit; and, on neglecting to show these marks, they shall each time forfeit two rix dollars to the oldermand, and two to the poor. Fishermen using such signs shall forfeit four rix-dollars each time.

When a master hath a pilot on board, he shall not be obliged to take another, on his coming into another pilot's district, if the pilot he has is acquainted and willing to proceed farther; though if the oldermand order another pilot, the former must quit, to prevent the harbour's being left destitute; if the pilot engages to go farther than he is acquainted, and a damage happens, he shall pay it, as the law directs. Danish Code, IV. B. I. Cap. V.A.

When a master has any reasonable cause to complain that his pilot has not done proper duty, and the weather permitting, colours were put out to show the want of a pilot, the master shall, in this case, take the pilot and oldermand, and, in the presence of two sea-faring shipmasters, whom the magistracy shall appoint, making an attestation thereof; and the master shall have credit for law-charges until a decision, each party obliging themselves to be satisfied therewith; and a pilot, having reason of complaint, is entitled to the same liberty.

The pilots are to have blanks in the master's language, for him to sign, notifying what he has paid him, as shall the pilot for what he has received.

Wind and weather permitting a pilot to conduct a ship into a convenient harbour, he must not, on any account, carry her into any one where the anchoring-ground is too deep, especially late in the year, or in winter, unless in cases of necessity; and then the pilot shall beforehand acquaint the master with the circumstances, and must, however, anchor in the most convenient place, on penalty of four-rix dollars; and the same sum on neglecting to take an attestation that it was not his neglect. A pilot conducting a ship through dangerous places, or altering the land-mark, shall be imprisoned for life in Bremerholm, or suffer death if he deserves it.

As the captain is allowed one-tenth of the pilotage, the oldermand of the pilots shall have three stivers on each rix-dollar, both of them to be deducted out of the stipulated rates; and, if pilots carry in and out of harbour vessels which do not lade or deliver in that country, the captain's salary shall be one-twentieth part.

Forfeitures to be distributed among poor sailors.

The collectors of the customs are to assist the pilots in getting their pilotage, and not clear the ship until they are satisfied, or have the oldermand's attest what draft of water she drew in and out, but must deduce the salaries, if the master has paid them to the oldermand.

A master, sailing before he has paid his pilot, shall, when met with in Norway, pay the debt, and the like sum to the poor, besides the law charges; and a master using a pilot ill shall forfeit as the law directs.

As pilots are always obliged to keep a look-out, they shall have reserves of others.

If the magistrate's or admiralty's decisions, in law-suits, between masters and pilots, be disliked, either party may appeal to the king.

If ships bound to any port within the Fœder, stop, with a fair wind, in any out-harbour, to smuggle, the pilot shall immediately inform the nearest officer of justice; and the master, on due proof being made against him, must pay two hundred rix-dollars, as directed in the Book of Rates: the same to be also observed North of the Naze; and the pilot neglecting to give such information, shall lose his place.

The king commands all his military officers to be assisting herein, and to keep these orders at law.

Masters of ships must have a true report at the custom-house, within twenty-four hours after their arrival; and, if required by the collector, must produce authentic bills of lading. The not reporting within this time limited, incurs a penalty of twenty rix-dollars daily; if a master neglects to report all his cargo, he must pay twenty per cent. on the value of that part omitted, unless he will make an oath it was an error, without any sinister intent to smuggle them. If they belong to master or mate, they are confiscable, and liable to double duty.

Masters must be careful not to sail without their told-zedel, which is a passport given them from the custom house, containing a list of the cargo, and that the lastage, teinde or tenths, a custom, and lights, are paid: otherwise being found without it, and the cargo discovered not to be duly entered, treble duty must be paid, and the master condemned to chains for life in Bremerholm; if the ship be only in ballast, the punishment is to pay ten rix-dollars; and the producing false passports, with an intent to defraud the revenue, incurs a forfeiture of both ship and goods.

Note. A Norske pilot's mile is equal to four English miles.

TABLE OF PILOTAGE.

The following Pilotage Table serves from the 16th of March to the 16th of October; but from the 16th of October to the 16th of March, ¼ is added in and out. When the outer rocks do not exceed 1 mile from the port, only single pilotage is paid.

For every foot above 18, one rix-dollar is paid more than 5 dollars.

Pilotage to sea 1-3d less than from sea. Nothing charged for ¼, ½, and ¾, of a foot.

Pilotage is paid by the mile, if not exceeding 4; if exceeding 4, and not above 8, 1-3d less; and for every mile above, ¼ less.

From the 16th of March to the 16th of October, as the table; from the 16th of March, ¼ more, in and out.

Feet Water.	Norway Money.			Sterling.			Norway Money.			Sterling.		
	Rd.	*ro.*	*s.*	£.	*s.*	*d.*	*Rd.*	*ro.*	*s.*	£.	*s.*	*d.*
4	1	0	0	0	4	0	0	1	8	0	1	4
5	1	0	0	0	4	0	0	1	8	0	1	4
6	1	0	0	0	4	0	0	1	8	0	1	4
7	1	1	8	0	5	4	0	1	12	0	1	6
8	1	2	16	0	6	8	0	1	12	0	1	6
9	2	0	0	0	8	0	0	1	16	0	1	8
10	2	1	8	0	9	4	0	1	16	0	1	8
11	2	2	16	0	10	8	0	1	20	0	1	10
12	3	0	0	0	12	0	0	1	20	0	1	10
13	3	1	8	0	13	4	0	2	0	0	2	0
14	3	2	16	0	14	8	0	2	0	0	2	0
15	4	0	0	0	16	0	0	2	8	0	2	4
16	4	1	8	0	17	0	0	2	8	0	2	4
17	4	2	16	0	18	8	0	2	16	0	2	8
18	5	0	0	1	0	0	0	2	16	0	2	8

Ships pay for pilotage in rix-dollars, rexorts, and skillings; and, when the exchange is at par, the rix-dollar is equal to four shillings, the rixort to one shilling, and the skilling to one half penny sterling.

Flat-bottomed vessels, of whatever denomination, that carry a lee-board, and are four times as long from stem to stern as they are broad in the midships, from the outer part of the gunwale on one side to the outer part of the gunwale on the other; as all clinker-built one-mast galliots and galleseas, whose breadth, as above, is more than one-third the length from stem to stern, shall, in the summer-season, pay half as much more, when the distance does not exceed one Norske mile, than a vessel of deep draught of water.

Whilst the pilot is on board, the ship-master must provide him fresh meat and drink; but if obliged by contrary winds to keep the sea, one, two, or more days, the master, exclusive of the pilotage, must pay the pilot ten rixorts daily.

N.B. Nothing to be paid the pilot for attendance whilst the ship is in harbour, nor can he demand provisions.

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